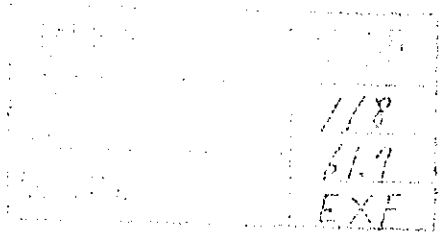
Hydrological Data Book
on
The Pampanga River Basin, Philippines
Major Floods During 1960-1974

October 1977

Japan International Cooperation Agency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Preface

Reference to the background of the Flood Forecasting System in the Pampanga River Basin is made at the beginning. In 1967 ECAFE/WMO, United Nations, made the recommendation for establishing the Flood Forecasting System, in order to reduce damage caused by the typhoon in the countries of the ECAFE region. Considering this recommendation, the Government of the Philippines chose the Pampanga River Basin as a pilot basin for the establishment of the system and requested assistance from the Government of Japan for the purpose. The Government of Japan, in reply to the request organized and dispatched a Survey Team for preparing a comprehensive plan of the flood forecasting system. The Government of the Philippines decided to put the plan in operation after the establishment and testing of equipment and the organization for flood forecasting were completed in October 1973.

This data book is prepared specially for the convenience of the flood forecaster for the Pampanga River Basin. It is quite usual for a flood forecaster to refer to data of past major floods in preparing flood forecasts. Generally speaking, the rainfall data are compiled by the Weather Bureau, while the gage height and discharge data by the Bureau of Public Works. It will be very beneficial and useful to the flood forecaster, if both data of past major floods are collected together, analysed, and kept at hand. It is hoped that this data book compiled in a handbook with meteorological data will be utilized for promoting the efficiency of flood forecasting operation.

This is indeed a very worthwhile task which should contribute towards the further development of flood forecasting technique in Philippines as well as the hydrological research in the ECAFE region.

Mr. Takenouchi initiated and took full charge of the data collection and compilation of this volume. This Agency expresses its sincere thanks and appreciation for his effort.

October 1977

Mitsuru Nagao

Mitsuru NAGAO
Executive Director,
Japan International Cooperation Agency

Contents

Introduction

There are many cases when a flood forecaster refers to the hydrological data of the past major floods in preparing a flood forecast. In the Pampanga River Basin, the forecasting technique is based on the analysis of data of past major floods. However, the rainfall, gage height and discharge data are kept separately by two agencies—— the Weather Bureau and the Bureau of Public Works. Undoubtedly, a data book consisting of rainfall, gage height and discharge data of past major floods will be used as reference material by the flood forecaster. The value of lag time between peak rainfall and corresponding peak gage height is one of the most useful information to a flood forecaster; therefore, a data book which includes lag time concerning past major floods will be convenient for his work. This data book is prepared primarily for the convenience of the flood forecaster.

Besides the primary objective, this data book can be utilized for the additional purposes as shown below. The original flood forecasting method which was proposed by the Japanese Team in 1970 and still used now was based on the limited hydrological data obtained at the time it was prepared. In the future, when the volume of available hydrological data has increased, it is quite possible that social demand for higher accuracy of flood forecasts will arise. Therefore, considerable improvement work for flood forecasting technique will have to be undertaken. At that time the original hydrological data should be referred to. It will then be very desirable to have on hand a good presentation of the original hydrological data from the beginning. Secondly, there are many cases when engineers, who accept the responsibility for preparing water resources development plans in the ECAFE region, suffer from the shortage of hydrological data. In this case they have to refer to the hydrological data obtained in near-by basins. The data obtained in the Pampanga River Basin will afford valuable information and reliable data. Lastly, the researchers who are interested in monsoon hydrology will be able to get valuable information from this publication. It is quite usual that a researcher will have to spend a lot of time for collecting hydrological data on a specific basin which are usually kept separately by various agencies concerned. This hydrological data book will enable a researcher to save time in collecting hydrological data.

The processes involved in collecting hydrological data are described as follows. In 1966, ECAFE/WMO, United Nations, organized and dispatched a team of experts to the Philippines in order to prepare a comprehensive plan for establishing a Flood Forecasting System. The Government of the Philippines designated the Pampanga River Basin as a pilot basin for this purpose. Mr. Takenouchi, expert of the team, with the cooperation of the Government of Philippines, collected meteorological and hydrological data which were necessary for making the plan. The data collected at that time are included in this hydrological data book. In 1969, in considera-

tion of the request from the Government of the Philippines, the Government of Japan sent a Survey Team to prepare a feasibility study on the Flood Forecasting System. The basin characteristics which are shown in 3, A General Remarks, were prepared by the Survey Team at that time. The Flood Forecasting Center was established in 1973, after the installation of instruments and equipment and training of engineers were implemented. Recognizing the necessity of compiling a hydrological data book for routine work, the Government of Japan sent Mr. Takenouchi to the Philippines in 1974 as an expert for the systematic collection and compilation of the hydrological data. After the visit of the Survey Team, three large floods severely affected the Pampanga River Basin and the flood of July 1972 was a historical one. All these data are also included in this data book.

It took three years from 1974 to 1977 to complete the collection and compilation of the needed hydrological data. This data book is divided in two parts, namely General Remarks and Details of Major Floods. The main body is the latter which contains the characteristics of each major flood, while the former shows the comparison of characteristics of each major flood with the use of figures and tables. For covenience of comparison, the characteristics of each major flood are described based on the following eight factors; namely: weather record, typhoon track, rainfall, gage height, discharge, peak time, flood damage and flood forecasting.

In compiling a handy data book, special attention is given to the following items.

(1) Table ..... The number of sheets of rainfall, gage height and discharge data included in this data book are so numerous. In order to avoid the troublesome work in reading proof, offset printing of hand writing was adopted. The scale of figures in hand writing was determined by experiment.

(2) Figure ..... The location of rainfall stations are shown by black circles on the isohyetal map. The observed value at the station is plotted on the map. The isohyetal maps of each major flood have been rearranged in a unified manner. The spacing of isohyetals is not always same for each major flood.

(3) Comparison ..... Comparisons of characteristics of each major flood are made on the predominant elements of each flood.

(4) Size of sheet ... For the convenience in locating data, the use of folded sheet has been avoided.

(5) Lag Time ..... Flood forecasting is possible because there is a time lag between peak rainfall and corresponding peak gage height. The time difference should be long enough to permit collection of hydrological data, formulation of forecast and dissemination of forecast. Data on lag time for the past major floods are collected and tabulated.

Acknowledgement

This data book could not have been published without the kind cooperation and assistance given by many engineers and meteorologists of both countries.

Regarding the meteorological and hydrological data, it is usual that only a part of them are published and most of the unpublished data are kept separately by the agencies concerned. The author is very grateful to the Government of the Philippines for making available both published and unpublished data. The assistance provided in copying data from original source documents is also appreciated. Published data books such as the Surface Water Supply Bulletin were provided to the Government of Japan.

It should be noted that the materials pertaining to weather records and typhoon tracks were arranged and collated by Filipino meteorologists and engineers. The tables and figures shown in 5, A General Remarks, were prepared mostly by Mr. Takenouchi for this data book.

The author expresses deep acknowledgement for the kind advice given by the members of the Typhoon Committee Secretariat.

The author is also indebted to many engineers and meteorologists who generously assisted in the preparation of materials. Special appreciation goes to the following engineers and meteorologists for their effort and advice.

(A) The Government of the Philippines

(i) PAGASA (Weather Bureau)

Messrs. Juanito Lirios, Zacarias Macaraig, Epifanio Sadang, Nestor Canuel, Heraclio Borja and Florante Camacho

(ii) Bureau of Public Works

Messrs. Leopoldo Kagahastian, Ernesto Reyes, Patricio Marquez, Jovito Navarro and Arturo Ladislao

(B) The Government of Japan

(i) The Japanese Survey Team (1969)

Messrs. Yutaka Inada (Leader), Toshio Takenouchi, Kiyohide Takeuchi, Terumi Nawata, Takeo Kinoshita, Takayoshi Yamamoto, Osamu Tsumura, Kenichi Sasaki and Kiyoshi Yamanaka

(ii) Experts (1973-1974)

1973 Messrs. Hiroshi Miyai, Hideaki Oda, Shigeki Yoshioka and Masamichi Komura

1974 Messrs. Kiyotaka Mukai, Toshio Takenouchi and Masamichi Komura

(C) Typhoon Committee Secretariat

Messrs. S.N. Sen, Atsushi Hamamori and Hidetomi Oi

A: General Remarks

1. Selection of Major Floods

When referring to the Hydrological Data Book, a flood forecaster will usually be more concerned with the characteristics of large floods. Six major floods were therefore selected from floods which occurred during the period of 1960-1974. These are enumerated as follows:

(1) Flood of Aug. 1960

(2) Flood of July 1962

(3) Flood of May 1966

(4) Flood of July 1972

(5) Flood of Oct. 1973

(6) Flood of Aug. 1974

2. Sources of Data

Meteorological and Hydrological Data are collected at three following offices of the Government of Philippines.

(a) PAGASA (Weather Bureau)

(b) Bureau of Public Works (BPW)

(c) Flood Forecasting Center (FFC)

The processes of collecting hydrological data for this volume are classified according to the three following categories. The first category is quoted directly from the document published by the agencies concerned. The second category is copied from the original record kept by the agencies. The last category is specially prepared for this volume based on the hydrological data contained in the material mentioned above.

Basin characteristics are quoted mostly from the report prepared by the Japanese Survey Team. The figures and tables contained in the report are prepared on the basis of the documents and maps kept by BPW.

The sources of data contained in this volume, like the characteristics of each major flood, are the following eight items.

(i) Weather Record

(ii) Typhoon Track

The documents concerning the past major floods kept by PAGASA have been rearranged so as to be suitable for this data book.

(iii) Rainfall

BPW had mostly the responsibility for obtaining rainfall data in the Pampanga River Basin before 1966, while PAGASA started significant improvement of the network of rainfall station in the basin in 1972. The rainfall data sent by the telemetering system are kept by FFC since 1973.
PAGASA and BPW have prepared isohyetal maps of daily rainfall for past major floods. The maps are valuable for the analysis of the amount and movement of heavy rainfall area.

(iv) Gage Height

(v) Discharge

In Table A.4.6 elevation of zero of gage height at each gaging station is shown in the form of above or below MSL (Mean Sea Level).

The gage height and discharge data are kept by BPW. The last annual report of gage height and discharge were issued in 1966. The data of mean daily gage height and discharge have not been published after 1967.

(vi) Time Difference between Peak Rainfall and Corresponding Peak Gage Height

The figures and tables showing the time difference between peak rainfall and corresponding peak gage height were prepared by Mr. Takenouchi.

(vii) Flood Damages

The survey of flood damage has been carried out extensively by BPW after each flood. BPW had published floods report for 1960, 1962 and 1966, including maps of flood limit. But only the report on the flood of 1960 and 1966 are referred to in this volume.

(Viii) Flood Forecasting

Since 1973, FFC started routine work on flood forecasting. This data book contains the summaries of forecasts.

3. Basin Characteristics

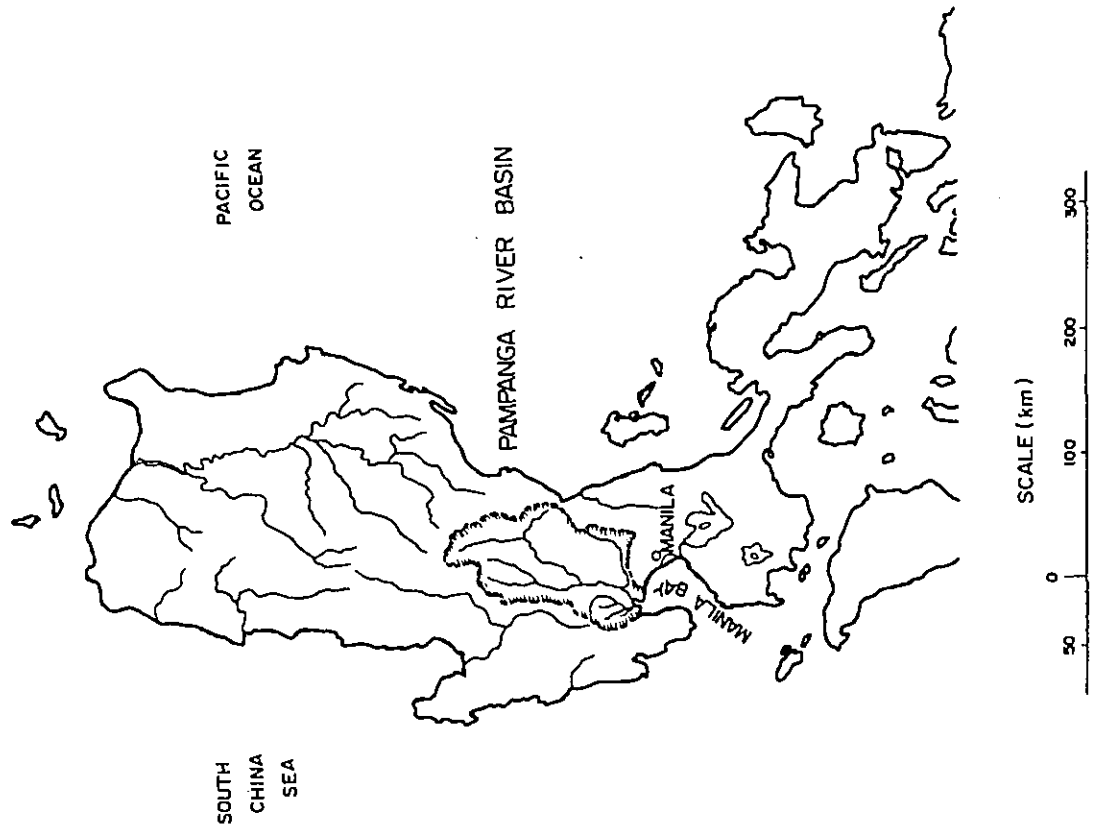


Fig. A.3.1 Location Map of the Pampanga River Basin

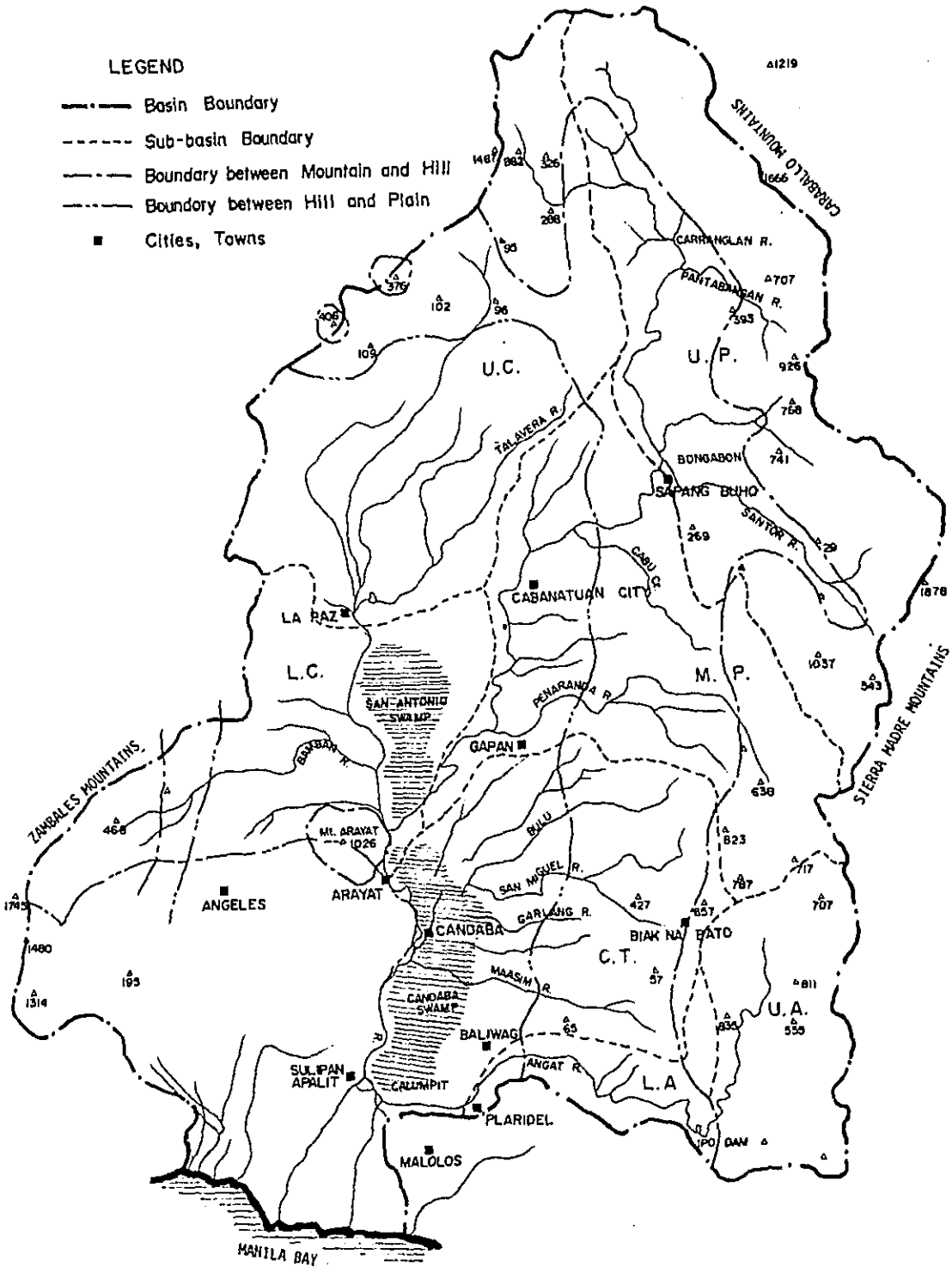


Fig. A.3.2 Topography of the Pampanga River Basin

Table A.3.1 Topographical Classification of Sub-basin

Name of Sub-basin	Classification of Area (km²)			Total Area	
	Mountain*	Hill**	Plain***	km²	%
Upper Pampanga (U.P.)	1238	662	0	1900	22
Middle Pampanga (M.P.)	323	567	488	1378	16
Upper Rio Chico (U.C.)	288	412	1060	1760	21
Lower Rio Chico (L.C.)	242	79	767	1088	13
Candaba Tributaries (C.T.)	77	663	745	1485	17
Upper Angat (U.A.)	623	17	0	640	8
Lower Angat (L.A.)	61	200	38	299	3
Total	2853	2600	3098	8550	100
%	33.3	30.4	36.3	100	

* Mountain area shows dense contours of 100m interval on a map having a scale of 1:250 000.

** Hill area is represented by sparse contour on the same map.

*** Plain area occupies the place where hardly any contour can be recognized on the same map.

Table A.3.2 Dimension of the Two Swamps

Name	Surface Area (km²)	Storage Volume (10^6.m³)	Drainage Area above Swamp (km²)	Remarks
San Antonio	124	700	2 848	Sub-basins of Upper Rio Chico and Lower Rio Chico
Candaba	220	1 000	7 454	Including the Area of San Antonio Swamp
Total	344	1 700		

Table A.3.3 Distance above River Mouth

Location of Gaging Station	Distance (km)
Sulipan, Apalit	25
Candaba, Pampanga	52
Arayat, Pampanga	69
Cabanatuan City	140
Supang Buho	177
(Divide near the Head of the Longest Stream)	260

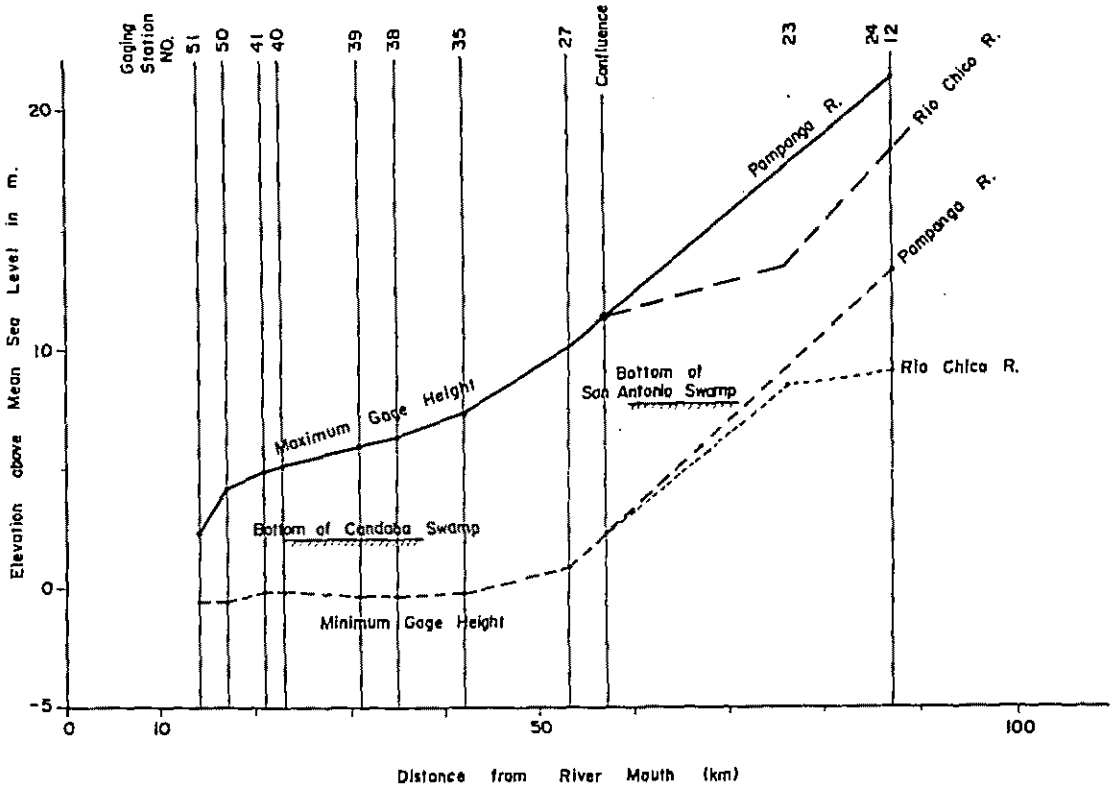


Fig. A.3.3 Maximum and Minimum Gage Heights along the Pampanga River during the year of 1960

Table A.3.4 Wet Season Runoff for Selected Sub-basins

Sub-basin	Stream Gaging Station			Wet Season Runoff (mm)		
	No.	Location	Drainage Area (km²)	Aug.-Oct. 1960	July-Oct. 1962	May-June 1966
Upper Panpanga	8	Malate	2015	1207	857	224
Middle Pampanga	27	San Agustin	6487	1185	942	332
Upper Rio Chico						
	19	Catalanacan	284	926	664	362
	20	Pasong Intsik	208	2345	1283	633
	21	Lomboy	261	1426	1173	651
Lower Angat	47	Poblacion	959	2249	1881	319

4. Hydrological Data

(1) Observation Time

(i) Rainfall

Rainfall observation is made at 0800 LST and recorded on the day before the day of measurement.

(ii) Gage Height

When the gage installed and observed is the recording type, the peaks involved are those actually recorded. When the gage installed and observed in a gaging station is non-recording, the discharge corresponding to the peak gage height observed and recorded is considered the peak discharge, although this may not be the case, since the gage is not observed continuously but read only three or more times a day. Since these non-recording gages are observed only three times a day although more often, during floods, the peak gage height might have occurred at times other than the times of observation. It is very possible that this might be the case, since most of the streams are flashy.

(2) Number of Station

(i) Registered Station

Table A.4.1 Registered Station

	1960-1966	1972-1974
Rainfall	31 (BPW) 5 (WB)	64 (WB)
Gage Height	57 (BPW)	57 (BPW)

(ii) Classification of Stream Gaging Station

Table A.4.2 Classification of Stream Gaging Station

	Number of Station
Non-recording	25
Recording	32
Total	57

(iii) Classification of Published Data in SWSB

In the tidal region and the swamp, it is very hard to calculate mean daily discharge because of complicated flow conditions. In these regions, data on mean daily gage height are published in SWSB instead.

Table A.4.3 Classification of Published Data in SWSB

	Number of Station
Mean Daily Gage Height	18
Mean Daily Discharge	39
Total	57

(iv) Location of Station

(a)	Rainfall Station (1960-1966)	Table A.4.4	(P. 13)
		Fig. A.4.1	(P. 16)
	(1972-1974)	Table A.4.5	(P.14-15)
		Fig. A.4.2	(P. 16)
(b)	Stream Gaging Station	Table A.4.6	(P.17-18)
		Fig. A.4.3	(P. 19)
(c)	Telemetering Station (1973-1974)	Table A.4.7	(P. 12)
		Fig. A.4.4	(P. 19)

Table A.4.7 Telemetering Station

Rainfall Station		Stream Gaging Station	
No.	Name	No.	Name
20	Sapang Buho	58	Sapang Buho
34	Papaya		
36	San Isidro	59	San Ishidro
30	Zaragoza	60	Zaragoza
38	Arayat	61	San Agustin
37	Sibul Spring		
41	Candaba	62	Candaba
46	San Rafael		
49	Sulipan	64	Sulipan
54	Ipo	63	Ipo

(3) Available Hydrological Data

(a)	Summary List of Available Data	Table A.4.8	(P. 20)
(b)	Summary List of Available Table and Figure	Table A.4.9	(P. 20)
(c)	List of Available Daily Rainfall Data	Table A.4.4-5	(P.13-15)
(d)	List of Available data of River Gaging Readings	Table A.4.6	(P.17-18)

Table A.4.4 Rainfall Stations (1960-1966)

No.	Name	River Basin	Location	Available Daily Rainfall Data			Remarks	Type
				August 1960	July 1962	May 1966		
I	Poblacion, Carranglan	Carranglan	Carranglan, N.E.	X			BPW	R
2	Pantagangan RGS	Upper Panpanga	Pialuan, Pantabangan, N.E.				BPW	
3	Poblacion, Pantabangan	Pantabangan	Pantabangan,N.E.				BPW	R
4	Santor RGS	Santor	Cuyapa, Gabaldon, N.E.	X		X	BPW	R
5	Santor RGS	Santor	San Vicente, Laur, N.E.	X		X	BPW	
6	Benituan RGS	Benituan	Guimba, N.E.	X			BPW	
7	Lomboy	Talavera	Lomboy, San Jose, N.E.	X		X	BPW	R
8	Pampanga RGS	Pampanga	Arayat, Pampanga				BPW	R
9	Madlum RGS	Madlum	San Miguel, Bulacan	X			BPW	
I0	Angat RIS, North Canal	Angat	San Rafael, Bulacan				BPW	
II	Angat RIS, South Canal	Angat	Bustos, Bulacan	X	X	X	BPW	
I2	Marcom Dam	Upper Pampanga	Talavera, N.E.	X			BPW	
I3	Rizal Dam	Upper Pampanga	Rizal, N.E.	X			BPW	
I4	Penaranda RIS	Penaranda	Tombo, San Leonardo, N.E.				BPW	
I5	Penaranda RIS	Penaranda	Poblacion, Gapan, N.E.				BPW	
I6	Penaranda RIS, Main Canal	Penaranda	Penaranda, N.E.	X			BPW	
I7	Penaranda RIS	Penaranda	Penaranda, N.E.	X			BPW	
I8	Dibabuyan Dam	Taravara	Munoz, N.E.	X			BPW	
I9	Bicalbical Headgate	Penaranda	Penaranda, N.E.				BPW	
20	Talavera RIS	Taravera	San Jose, N.E.	X			BPW	
2I	Sumacbao RGS	Penaranda	Gen. Tinio, N.E.				BPW	R
3I	Cabanatuan			X	X	X	WB	R
32	Apalit						WB	R
33	Arayat				X	X	WB	R
34	Gabaldon					X	WB	R
35	Gapan					X	WB	R
	Total			I4	3	8		

Table A.4.5 Rainfall Stations (1972-1974)

Station Number	Location	Available Daily Rainfall Data		
		August 1972	October 1973	August 1974
I	Baguio City			
2	Barat, Bambang, Nueva Visaya			
3	Balatoc Mines, Itogon, Benguet			
4	Salinas, Bambang, N.V.			
5	Dupax, N.V.			
6	Consuelo, Sta. Fe, N.V.		X	
7	Dagpan City		X	
8	Rosales, Pangasinan		X	
9	Camiling, Tarlac		X	
IO	Pantabangan Dam, N E.	X	X	X
II	TRIS Dam, Tayabo, San Jose City, N.E.	X	X	X
I2	Camanacsacan, San Jose City, N.E.	X	X	X
I3	Baler, Quezon		X	
I4	Tondod, San Jose City, N.E.	X	X	X
I5	PRIS Dam, Rizal, N.E.	X	X	X
I6	Baloc, Sto. Domingo, N.E.	X	X	X
I7	LTRIS Dam, Llanera, N.E.		X	X
I8	Sibul, Talavera, N.E.	X		X
I9	Pinahan, Gen. Natividad, N.E.	X	X	X
20	Sapang Buho, Gen. Tinio, N.E.		X	
2I	Murcon Dam, Talavera, N.E.	X	X	X
22	PBRIS Dam, Atate, Gen. Natividad, N.E.			X
23	Bantug, Talavera, N.E.	X	X	X
24	Quezon, N.E.	X	X	X
25	Pamaldan, Cinco-Cinco, Cabanatuan,City, N.E.	X	X	X
26	Cabanatuan City, N.E.	X	X	
27	Bangad, Cabanatuan City, N.E.	X	X	X
28	Zaragoza, N.E.	X	X	
29	Gabaldon, N.E.	X	X	X
30	Zaragoza		X	
3I	San Miguel, Ha. Luisita, Tarlac	X		X
32	Lambakin, Jaen, N.E.	X	X	X
33	Mallorca, San Leonardo, N.E.	X	X	
34	Papaya		X	
35	Gapan, N.E.	X		X
36	San Isidro,N.E.		X	
37	Sibul Spring, Bulacan		X	
38	Arayat, Pampanga		X	
39	San Agustin, Arayat, Pampanga	X	X	X
40	San Miguel, Bulacan	X	X	

(Continued)

Station Number	Location	Available Daily Rainfall Data		
		August 1972	October 1973	August 1974
41	Candaba, Pampanga		X	
42	Buenavista Estate, San Ildefonso, Bulacan			
43	Sta. Cruz, Porac, Pampanga	X	X	X
44	San Fernando, Pampanga			X
45	Bacolor, Pampanga		X	X
46	San Rafael, Bulacan		X	
47	Sabang, Baliwag, Bulacan	X	X	
48	Apalit, Pampanga	X	X	
49	Sulipan, Apalit, Pampanga		X	
50	Makinabang, Baliwag, Bulacan		X	X
51	San Lorenza, Norzagaray, Bulacan	X	X	
52	Ipo Junction, Norzagaray, Bulacan			
53	Marungko, Angat, Bulacan			X
54	Ipo		X	
55	Masantol, Pampanga			X
56	Malolos, Bulacan		X	X
57	San Agustin, Hagonoy, Bulacan			
58	Borol, Balagtas, Bulacan		X	
59	Sta. Maria, Bulacan			
60	Minuyan, San Jose del Monte, Bulacan		X	X
61	Infanta, Quezon		X	
62	Obando, Bulacan		X	
63	Science Garden, Q.C.		X	
64	WB Port Area, Manila		X	
	Total	26	49	28

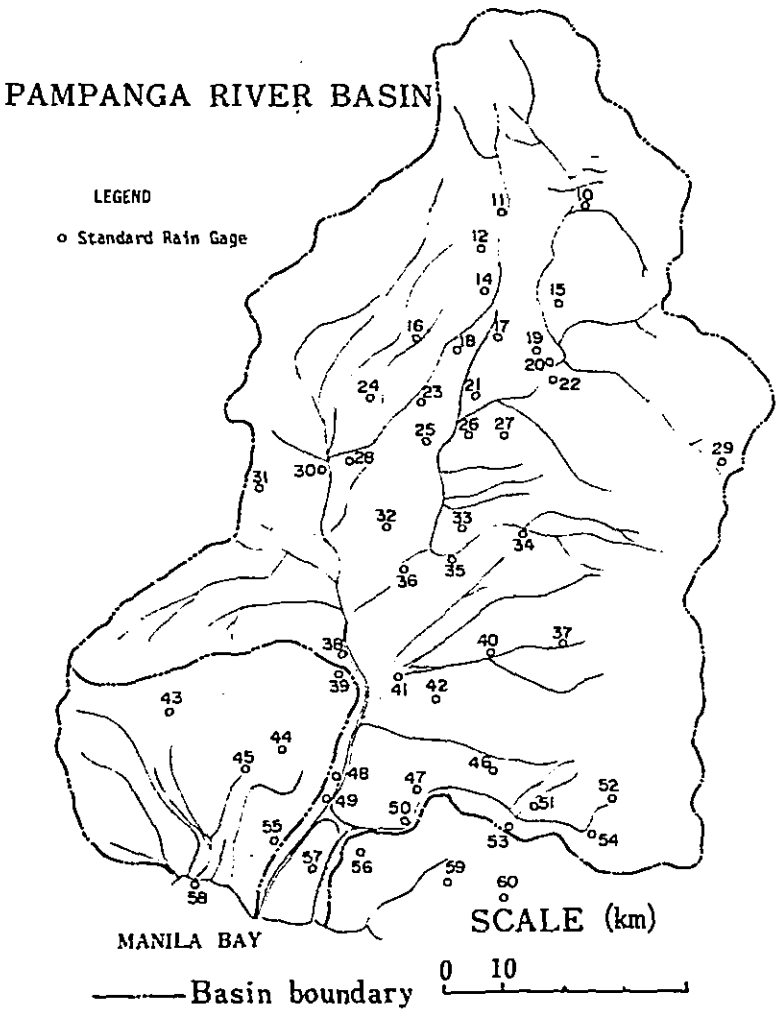


Fig. A.4.2 Location of Rainfall Stations
(1972 - 1974)

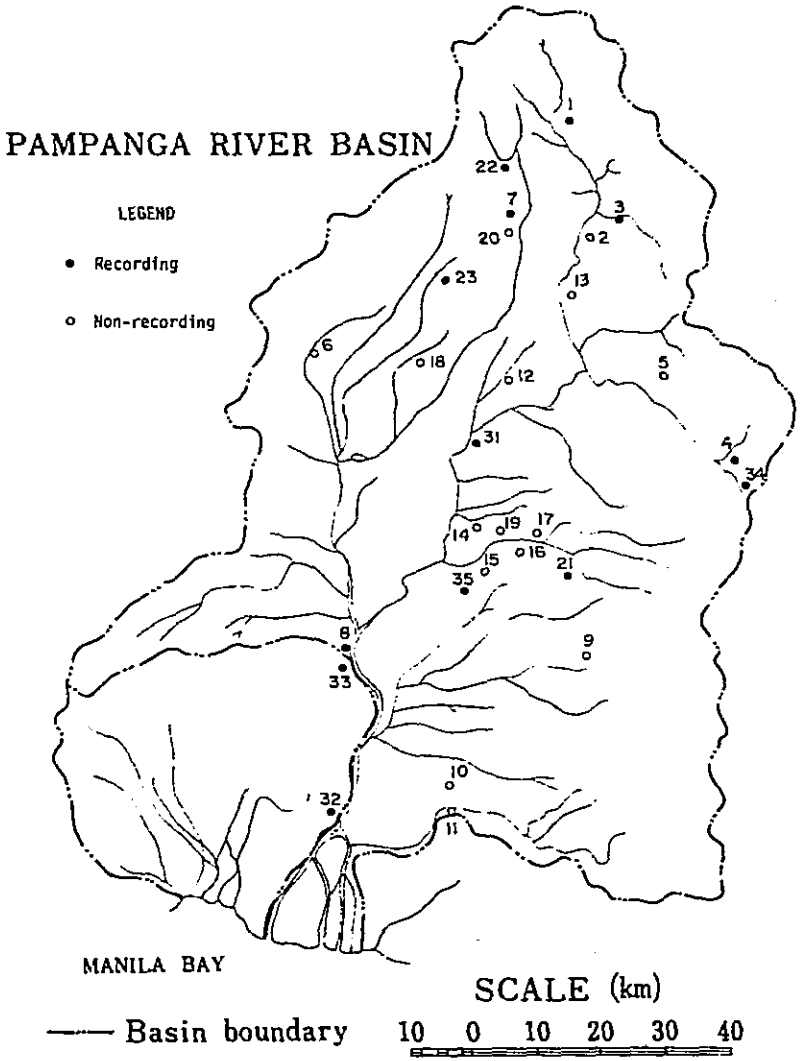


Fig. A.4.1 Location of Rainfall Stations
(1960 - 1966)

Table A.4.6 Stream Gaging Stations (1960-1974)

Station Number	River	Location	Orainage Area	Elevation of Zero Gage above MSL(m)	Type	Available Data of River Gaging Readings						Remarks
						I960	I962	I966	I972	I973	I974	
I	Carranglan	Baluarte, Carranglan, Nueva Ecija	258	306.426	S	X	X	X	X			
2	Pantabangan	Poblacion, Pantabangan, N.E.	253	I48.579	N				X			
3	Pampanga	Pialuan, Pantabangan, N.E.	838	I32.932	S			X				
4	Digmala	Labi, Bongabon, N.E.	52	—	S			X	X			
5	Santor	Cuyapa, Gabaldon, N.E.	89	I22.445	S		X	X	X			
6	Santor	San Vicente, aur, N.E.	544	75.787	S		X	X	X			
7	Coronel(Santor)	Bangkerohan, Bongabon, N.E.	709	50.943	N	X	X	X	X		X	
8	Pampanga	Malate, Bongabon, N.E.	20I5	39.604	S			X	X			
9	Cabu	Cabu, Cabanatuan City	I43	39.254	S	X	X	X	X	X	X	
I0	Pampanga	Valdef ente, Cabanatuan City	244I	—	S				X			
II	Tabuating	Soledad, Sta. Rosa, N.E.	8I	24.073	N			X	X		X	
I2	Pampanga	San Anton, San Leonardo, N.E.	285I	I0.90I	S			X	X	X		
I3	Chico	Ilog Na Munti, Gen. Tinio, N.E.	I49	4I.&34	N	X	X	X	X	X	X	
I4	Smacbao	Pias, General Tinio, N.E.	287	4I.2I5	N	X	X	X	X	X		
I5	Penaranda(HW)	San Josef, Penaranda, N.E.	5II	0.806	N	X	x	X	X	X		
I6	Penaranda	San Josef, Penaranda, N.E.	5I2	I.624	N			X	X	X		
I7	Penaranda	Poblacion, Gapan, N.E.	573	II.880	N	X	X	X	X	X		
I8	Pampanga	San Vicente, Cabiao, N.E.	3467	0	S							
I9	Baliwag	Catalanacan, Munoz, N.E.	284	50.I85	S			X	X	X		
20	Benituan	Pasong Intsik, Guimba, N.E.	208	22.I88	S			X.	X	X		
2I	Talavera	Lomboy, San Jose, N.E.	26I	I48.60	S			X	X			
22	Talavera	Caboboloonan, Talavera, N.E.	43I	60.506	N			X	X		X	
23	Rio Chico	Sto. Rosario, Zaragaza, N.E.	II77	8.4I	N				X	X		
24	Rio Chico	Sta. Monica, Conception, Tarlac	2090	0.564	S							
25	Parua	San Nicolas, Bamban, Tarlac	I48	68.I37	N						X	
26	Rio Chico	Banga, Arayat, Pampanga	I246	I0.982	S							
27	Pampanga	San Agustin, Arayat, Pampanga	6487	-3.479	S			X	X	X		
28	Madlum	Sibul,Springs, San Miguel, Bulacan	I02	39.663	N							
29	Balaong-Maldum	Sta. Ines, San Miguel, Bulacan	204	-II.357	S							
30	San Miguel	San Vicente, San Miguel, Bulacan	256	-I0.488	N						X	

(Continued)

Station Number	River	Location	Drainage Area	Elevation of zero gage above MSL	Type	Available Data of River Gaging Readings						Remarks
						I960	I962	I966	I972	I973	I974	
31	Bulo	Malibay, San Miguel, Bulacan	57		S							
32	Carlang Creek	Carlang, San Ildefonso, Bulacan	5	4.38I	N							
33	Carlang	Carlang, San Ildefonso, Bulacan	85	4.865	N							
34	Candaba Swamp	Oucma, Candaba, Pampanga	7454	0	N							
35	Pampanga	Pasig, Candaba, Pampanga	7468	-II.050	N							
36	Maasim	Diliman, San Rafael, Bulacan	I50	II.389	S						X	
37	Maasim	Bahay-Pare, Candaba, Pampanga	I74	2.337	N							
38	Pampanga	Sta.Cruz, San Luis, Pampanga	7756	-I0.472	S	X	X				X	GH
39	Pampanga	San Juan, San Simon, Pampanga	7776	-3.765	N						X	GH
40	Pampanga	Sulipan, Apalit, Pampanga	7849	-I0.554	S			X	X	X		GH GH
4I	Sulipan Cut-off	Sulipan, Apalit, Pampanga	7874	-I0.54	N							GH
42	Francis	San Miguel, Calumpit, Bulacan		-I0.855	N							GH
43	Angat(Above Ipo)	Batong Puti, Norzagaray, Bulacan	55I		S							
44	Angat(Below Ipo)	Norzagaray, Bulacan	629		S							
45	Bayabas	Pulong, Sampaloc, Angat, Bulacan	74		S							
46	Angat	Longos, Pulilan(Plaridel Bridge),Bulacan	959	-I0.000	S			X	X	X	X	
47	Angat	Poblacion, Pulilan	963	-0.4I5	N							GH
48	Angat	Pungo, Calumpit, Bulacan	I0I4	-I.372	N						X	GH
49	Pampanga	Poblacion, Calumpit, Bulacan	79I0	-I0.737	S						X	GH
50	Pampanga	San Miguel, Calumpit, Bulacan	79I4	-I0.6I0	N							GH
5I	Bebe C.O.C.No.I	Bebe, Masantol, Pampanga			S							GH
52	Bebe C.O.C.No.2	Bebe, Masantol, Pampanga		0	S							GH
53	Pampanga	Budbud, Masantol, Pampanga		-I.065	S							GH
54	Labangan	Bagbag, Calumpit, Bulacan	I0I6	-I0.606	S						X	GH
55	Labangan	San Antonio, Hagonoy, Bulacan		-I.654	S							GH
56	Labanganl	Halang, Hagonoy, Bulacan		-2.50	N							GH
57	LabanganLa	Tibagin, Hagonoy, Bulacan		-2.079	S							GH
58		Sapang Buho		49.50								TEL
59		San Isidro		I9.55								TEL
60		Zaragoza		0								TEL
6I		San Agustin		0								TEL
62		Candaba		0								TEL
63		Ipo										
64		Sulipan		0								TEL

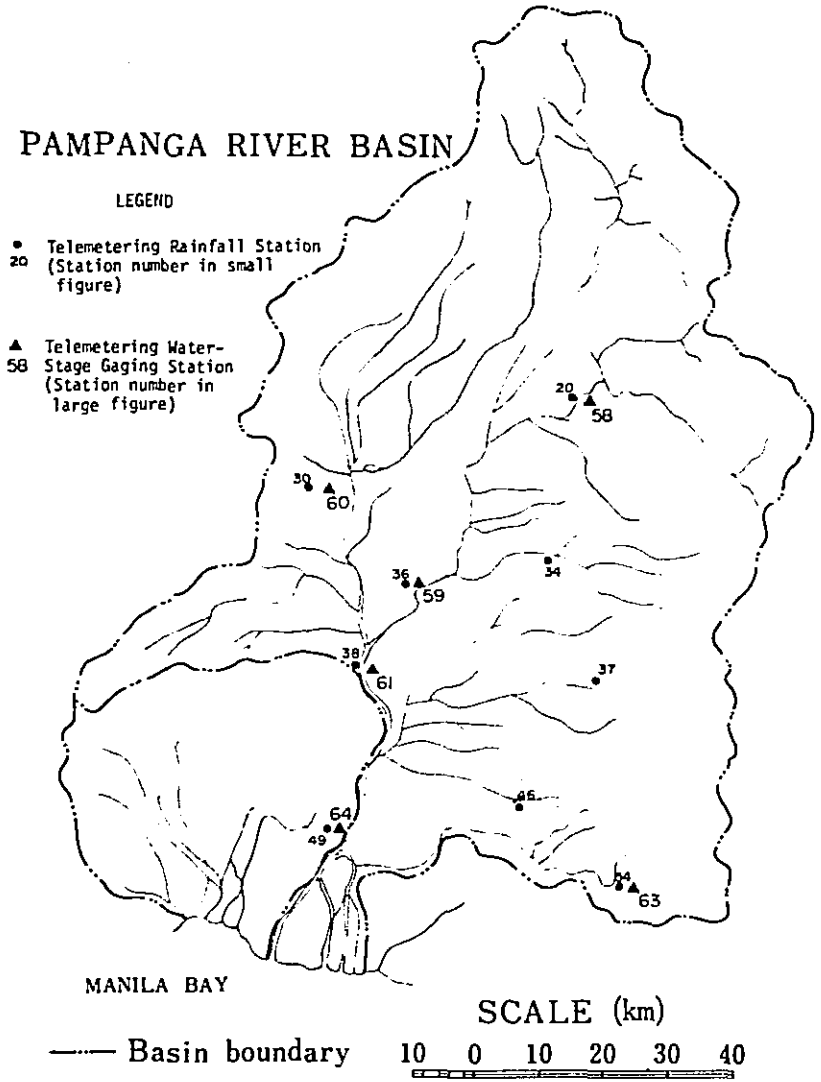


Fig. A.4.4 Location of Telemetering Stations

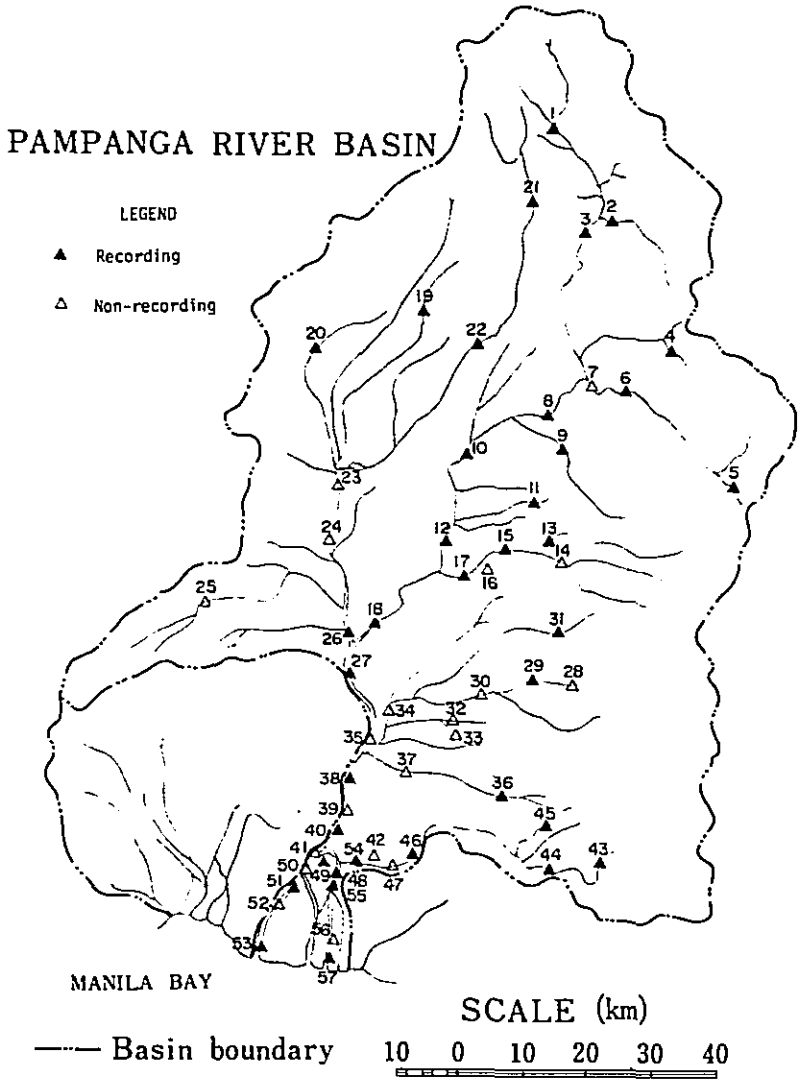


Fig. A.4.3 Location of Stream Gaping Stations

Table A.4.8 List of Available Data (Period of Available Record and Number of Station)

		1960	1962	1966	1972	1973	1974
(3) Rainfall	Hourly(Recorder)			May 18-21 (4) 4	July5-Aug.5 (23) 10		
	Hourly(Telemeter)					Oct.6-18 (10) 10	June9-12(4) July18-22(5) Aug.13-19(7) 10
	Daily(Observer)	Aug. 14	July 4	May 8	June-Aug. 26	Oct. 49	June-Aug. 28
(4) Gage Height	River-Gage Reading (Gage Keepers)	Aug. 8	July 10	May 23	July-Aug 24	Oct. 14	Aug. 14
	Hourly(Recorder)						
	Hourly(Telemeter)					Oct.15-16 (12) 7	June3-15(13) July20-25(6) Aug.13-26(14) 7
	Peak Gage Height	Aug. 46	July 46	May 46			
	Mean Daily Gage Height (Calculated)	Aug. 3	July-Aug. 3	May-June 3	June-Aug. 1	Oct. 1	Aug. 1
(5) Discharge	Peak Discharge	Aug. 46	July 46	May 46			
	Mean Daily Discharge	Aug. 7	July-Aug. 7	May-June 7			

Remarks : In each boxed frame, the figures in the upper left corner show the period of available data, while the figures in the lower right corner show the number of station.

Table A.4.9 List of Available Tables and Figures

Classification	Item	Table 60	62	66	72	73	74	Figure 60	62	66	72	73	74
(3) Rainfall	Hourly Rainfall			X	X	X	X					X	X
	Daily Rainfall (Isohyetal Map)	X	X	X	X	X	X	X	X	X	X	X	X
	Basin Daily Rainfall	X	X	X	X	X	X						
(4) Gage Height	River Gage Reading	X	X	X	X	X	X						
	Hourly Gage Height					X	X					X	X
	Mean Daily Gage Height							X	X	X			
(5) Discharge	Mean Daily Discharge							X	X	X			
(6) Peak Time (i) Peak Time	Peak Gage Height (Areal Distribution)	X	X	X				X	X	X			
(ii) Time Difference	Date and Time of Peak Hourly Rainfall, and that of Corresponding Peak Hourly Gage Height				X	X	X			X	X	X	X
	Date of Peak Daily Rainfall, and Date and Time of Corresponding Peak Hourly Gage Height											X	X
	Date of Peak Daily Rainfall and corresponding Peak Daily Gage Height							X		X	X		
	Hourly Gage Height Hydrograph with Hourly Rainfall at Sulipan, Apalit											X	X

(4) List of Histogram and/or Hydrograph

(i) Time Interval: Hour

(a) Histogram of Rainfall

Table A.4.10 List of Rainfall Histogram

	Number of Station	Remarks
1960		
1962		
1966		
1972		
1973	10	Fig. B.5.2 (P. 176)
1974	10	Fig. B.6.4 (P. 220)

(b) Gage Height Hydrograph

Table A.4.11 List of Gage Height Hydrograph

	Number of Station	Remarks
1960		
1962		
1966		
1972		
1973	7	Fig. B.5.13 (P. 194)
1974	7	Fig. B.6.17 (P. 252)

(c) Hourly Gage Height Hydrograph with Hourly Rainfall

Table A.4.12 List of Hourly Gage Height Hydrograph with Hourly Rainfall at Sulipan, Apalit

	Available Data	Remarks
1960		
1962=		
1966		
1972	X	Fig. B.4.30-31 (P. 161)
1973	X	Fig. B.5.16 (P. 197)
1974	X	Fig. B.6.20 (P. 255)

(ii) Time Interval: Day

(a) Mean Daily Gage Height and Discharge

Table A.4.13 List of Hydrographs of Mean Daily Gage Height and Discharge

	Number of Station	Remarks
1960		
1962		
1966		
1972	10	Fig. B.1.14 (P. 55)
1973	10	Fig. B.2.7 (P. 80)
1974	10	Fig. B.3.9 (P.108)

(5) List of Time Difference

(i) Peak Gage Height (Areal Distribution)

Table A.4.14 List of Areal Distribution of Date and Time of Peak Gage Height

	Available Data	Remarks
1960	X	Fig. B.1.15 (P. 56)
1962	X	Fig. B.2.8 (P. 81)
1966	X	Fig. B.3.10 (P.109)

(ii) Peak Rainfall and Corresponding Peak Gage Height

(a) Time Interval: Hour

Table A.4.15 List of Time Difference between Two Peaks (1)

Year	Hourly Rainfall		Hourly Gage Height			Remarks
	Recording Chart	Telemeter	Recording Chart	Gage Keeper	Telemeter	
1960						
1962						
1966	X		X			Fig. B.3.11
1972	X			X		Fig. B.4.27
1973		X			X	Table B.5.35 Fig. B.5.14
1974		X			X	Table B.6.67 Fig. B.6.18

(b) Time Interval: Day

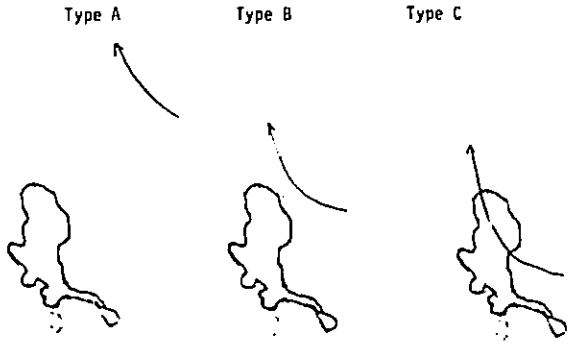
Table A.4.16 List of Time Difference between Two Peaks (2)

Year	Available Data	Remarks
1960	X	Fig. B.1.16 (P. 56)
1962		
1966	X	Fig. B.3.12 (P. 110)
1972	X	Fig. B.4.29 (P. 160)
1973		
1974		

5. Comparison of Characteristics of Major Flood

Table A.5.1 Classification of Typhoon Tracks

Type	Flood	
	Month, Year	Order of Magnitude of Flood Runoff Volume
A	Aug. 1960	2
	July-Aug. 1972	1
B	July 1962	3
	Aug. 1974	5
C	May 1966	4
	Oct. 1973	6



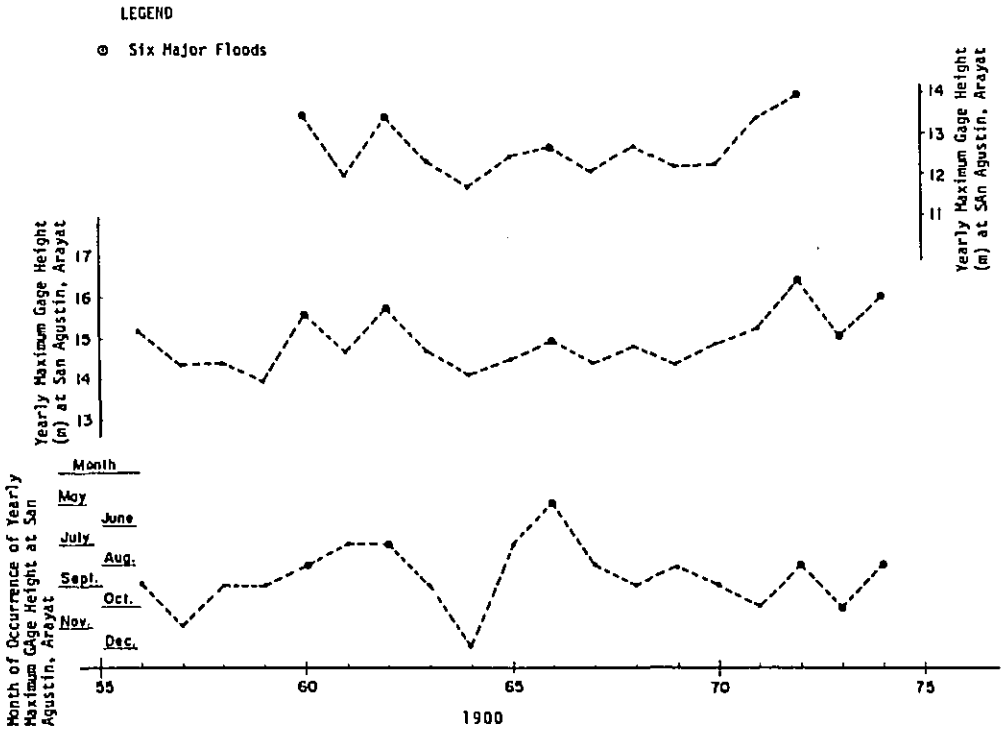


Fig. A.5.1 Yearly Maximum Gage Heights at San Agustin, Arayat, and Sulipan, Apalit

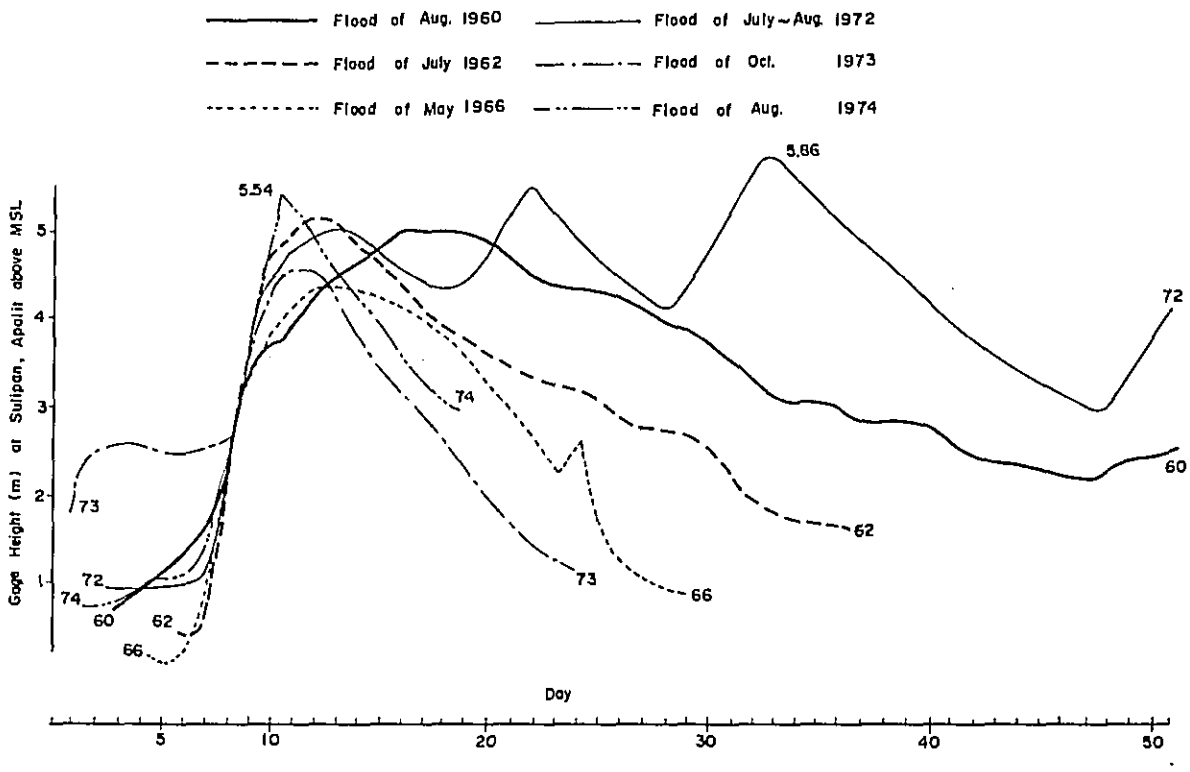


Fig. A.5.2 Comparison of Major Flood Hydrographs at Sulipan, Apalit

Table A.5.2 Annual Maximum Gage Height and Discharge at Seven Gaging Stations Related to Telemetering Stations for 1966-1974

Stream Gaging Station (BPW)	No.	8			12			23			27		
	River	Pampanga			Pampanga			Rio Chico			Pampanga		
	Location	Malate, Pampanga, N.E.			San Anton, San Isidro N.E.			Sto. Rosario, Zaragoza, N.E.			San Agustin, Arayat, Pampanga		
No.	Year	Date and time	Gage Height (m)	Discharge (m)	Date and time	Gage Height (m)	Discharge (m)	Date and time	Gage Height (m)	Discharge (m)	Date and time	Gage Height (m)	Discharge (m)
I	1956												
2													
3													
4													
5	60	Oct.14, 8A	5.25	I 383	Aug.17, 11P	8.13	I 530	Aug.16, 7P	10.69	530	Aug.17, 2A	13.46	2 372
6	61	June28, Ia	3.47	648	June28, 6:30A	6.85	I 126	July I, 8A	8.54	305	July 8, N	12.05	I 434
7	62	July23, 8A	5.25	I 378	June22, IIA	8.58	I 674	July23, 9A	9.16	361	July23, 5P	13.38	2 316
8	63	Aug.15, 3A	5.16	I 345	Aug.15, N	7.85	I 441	Sept.12, 5P	9.00	346	June30, 7A	12.27	I 550
9	64	Dec.17, 3A	5.70	I 572	Dec.17, 7A	7.82	I	Dec.17, 5P	7.32	212	Dec.17, 7A	11.70	I 318
10	65	July14, 6A	5.35	I 425	July15,11:20P	8.40	I 617	July18, 8A	8.96	343	July16, 7A	12.50	I 700
11	66	Nov.22, 5A	6.48	I 899	Nov.23, 7A	7.74	I 405				May22, 5P	12.70	I 840
13	67	Oct.18,7:20A	4.69	I 147	Nov.5, 5:20P	8.54	I. I	Oct.19, 5P	7.90	254	Aug.20, 5P	12.10	I 456
14	68	Sept.29, 4P	3.90	816	Sept.30, Ia	6.89	I 138	July31, 5P	8.90	337	Sept.1, 5P	12.69	I 833
15	69	July28, 6A	3.00	466	Aug.9, 9:30P	6.10	901	Aug.11, 5P	8.53	304	Aug.10, 7A	12.21	I 514
16	70	Sept.12, 2A	4.01	862	Oct.15, 7A	7.61	I 364	Sept.17, 7A	8.66	316	Sept.3, 5P	12.25	I 538
17	71	Dec.31, 5A	5.20	I 362	Oct.11, 7A	8.36	I 572	Oct.12, 5P	8.65	315	Oct.14, 5P	13.36	2 302
18								Aug.1, 5P	8.95	342	July20, 7A	13.98	2 722
19													

Name of Telemetering Water-Stage Station related to the Station above mentioned (FFC)	No.	58	59	60	61
	River	Pampanga	Pampanga	Rio Chico	Pampanga
	Location	Sapang Buho	San Isidro	Zaragoza	San Agustin

Stream Gaging Station (BPW)	No.	34			46			4n	
	River	Candaba Swamp			Angat			Pampanga	
	Location	Duema, Candaba, Pampanga			Plaridel Br.,Longos,Pulilan, Bulacan			Sulipan,Apalit,Pampanga	
No.	Year	Date and Time	Gage Height (m)		Date and time	Gage Height (m)	Discharge (m)	Date and time	Gage Height (m)
I	1956							Sept.28	13.17
2	57							Nov. 18	14.35
3	58							Sept.12	14.41
4	59				Nov.18 7A	17.51	1012	Sept.3	13.95
5	60	Aug.17 5P	7.02		Aug.14 10P	20.28	1675	Aug.15	15.66
6	61	July 8 5P	5.87		Sept.22 7P	18.74	1320	July9	14.66
7	62	July25 7A	6.86		June21 1:30A	20.19	1702	July23	15.77
8	63	July1 7A	5.97		June29 7:30A	18.10	1160	Sept.12	14.72
9	64	Aug.25 5P	5.84		Dec.15 11:30P	17.74	1070	Dec.19	14.12
10	65	July16 5P	5.57		July14	14.76	416	July13	14.50
11	66	May23 7A	6.10		May23 5P	14.13	319	May24	13.97
12	67	Aug22 7A	5.65		Nov.10 6A	13.85	277	Aug.22	14.42
13	68	Aug.23 5P	6.30		Sept.2 6A	14.50	315	Sept.2	14.82
14	69	Sept.1 5A	5.60		July28 5P	13.93	289	Aug.9	14.42
15	70	Sept.7 7A	6.28		Sept.1 5P	15.00	455	Sept.5	14.86
16	71	Oct.15,16	6.30		Dec.31 7A	14.80	423	Oct.15	15.28
17.	72				Jan.5 7A	13.00	162	Aug.1	16.41
18	73							Oct.13	14.89
19	74							Aug.18	16.09

Name of Telemetering Water-Stage Station related to the Station above mentioned (FFC)	No.	62	63	64
	River	Candaba Swamp	Angat	Pampanga
	Location	Candaba	Ipo	Sulipan

Table A.5.3 Yearly Maximum Gage Height for the Floods of 1960, 1962 and 1966

Station Number	Location	1960			1962			1966		
		Date	Gage Height	Peak Discharge	Date	Gage Height	Peak Discharge	Date	Gage Height	Peak Discharge
1	Baluarte	July31,11:00A	3.72	551	July23,2:00A	4.21	887	May20,4:15P	4.22	832
2	Poblacion	Aug.9,6:00P	4.60	761	July20,10:15A	4.20	621	May20,5:00P	3.85	499
3	Pialuan	Aug.17,6:00A	4.98	834	July20,11:00P	5.80	1069	May20,5:00P	5.12	875
4	Labi	Aug.14	4.48	132				Nov.20,9:00P	4.48	28.7
5	Cuyapa	Sept.30,9:30A	4.27	241	July22,3:00A	3.88	202	Nov.22,5:30A	4.80	284
6	San Vicente	Oct.8,12:30A	4.20	364	July21,5:30A	5.41	391	Nov.21,1:30A	5.54	555
7	Bangkerohan	Oct.14,6:00A	5.05	977	July21,6:00A	5.54	1150	May20,6:00A	5.75	11(6
8	Malate	Oct.14,8:00A	5.25	1383	July23,8:00A	5.24	1379	Nov.22,5:30A	6.48	1900
9	Cabu	Oct.13,10:30P	4.38	241	July21	4.38	145	May20,9:00P	2.99	111
10	Valdefuente							Nov.23,7:00A	4.96	1516
11	Soledad	Oct.13,7:00A	7.50	351	July23,6:00P	6.15	225	May22,5:00P	6.20	229
12	San Anton	Aug.17,11:00P	8.13	1531	July22,11:00A	8.58	1675	Nov.23,7:00A	7.74	406
13	Ilog Na Mundi	Oct.14	3.40	272	July21,8:00A	3.00	162	May21,8:00A	4.00	439
14	Pias	Oct.23,6:00A	5.25	1414	July21,5:00P	3.98	792	Nov.21,8:00A	2.57	293
15	San Josef (NW)	Aug.17,6:00A	31.60		July22,6:00A	31.10		Nov.14,6:00A	31.60	
16	San Josef (Br)	Aug.17,4:20A	29.68	560	July22	29.64	550	Nov.21,6:00A	29.40	490
17	Poblacion	Aug.17,5:30A	6.59	726	July22,7:00A	6.30	629	Nov.21,7:00A	7.25	1033
18	San Vicente	Oct.17,12:00N	12.00	1098	July22,5:00P	11.70	929	Nov.24,5:00P	10.86	827
19	Catalanacan	Aug.8,7:00A	3.29	315	July21,8:45P	5.68	426	May21,6:00A	3.36	336
20	Pasong Intsik	Aug.14,9:00P	6.60	764	July21,12:00N	7.20	795	May21,12:00N	7.45	858
21	Lomboy	Aug.22,4:00P	3.45	599	July24,3:00P	3.62	585	May20,6:00P	4.10	879
22	Caboboloonan	Aug.17,6:00A	3.55	[illegible]	July21	4.24	495	May20,5:00P	4.80	789
23	Sto.Posario	Aug.16,7:30P	10.69	531	July23,8:00A	9.16	361			
24	Sta.Monica				July23,7:00A	12.76	253	May21,7:00A	11.91	151
25	San Nicolas	June27	2.78	193	July2),5:00P	5.20	96	5 Nov.24,5:00P	3.89	203
26	Bangan									
27	San Agustin	Aug.17,2:00A	13.46	2372	July23,5:00P	13.38	2316	May22,5:00P	12.70	1840
28	Sibul Springs	Oct.14,7:00A	5.00	280	July19,9:00P	5.20	308	Oct.22,7:00P	3.70	116
29	Sta.Ines	Aug.11	6.41	403	July21,11:30A	7.90	900	Nov.21,7:00A	7.47	750
30	San Vicente	Oct.13,7:00A	24.90	1051				Nov.21,6:00A	24.84	1025
31	Malibay							May22,3:20P	5.93	201
32	Carlang	Aug.15,5:00P	5.20	13.3	July21,	5.72	16.4	July19,7:00A	4.64	9.9
33	Carlang	Aug.14-15,7:00A	6.45	39.1	July21,	6.18	35.5	Nov.22,7:00A	5.00	21.7
34	Ducma	Aug.17,5:00P	7.02		July25,7:00A	6.86		May23,7:00a	6.10	
35	Pasig	Aug.17,12:00N	18.28	1330	July24,5:00P	18.17	1308	May23,7:00A	17.80	1229
36	Diliman	Aug.14,8:00P	8.21	1192	July21,7:00A	8.41	1227	Nov.21,7:00A	8.98	1519
37	Bahay Pare	Oct.14,5:00P	600	589	July21,7:00A	6.10	618	Nov.21,5:00P	5.95	575
38	Sta.Cruz	Aug.16,12:00N	16.78		July24,7:00A	16.66		Nov.24,5:00P	15.93	
39	San Juan	Aug.17,5:00P	9.51		July24,5:00P	9.52		May23,5:00P	8.84	
40	Sulipan	Aug.15,4:00A	15.66		July24,6:00P	15.77		May24,10:00A	14.97	
41	Sulipan	Aug.15,7:00A	15.48		July24,5:00P	15.58		May24,7:00A	14.90	
42	San Miguel	Aug.18,5:00P	13.70		July24,5:00P	12.40		May21,5:00P	12.52	
43	Batong Puti	Aug.14,2:30P	7.78	2043	July21	8.78	2403			
44	Ipo	Aug.14,3:30P	6.99	2264	July21,7:20P	8.38	3128	Oct.20,12:00N	4.10	668
45	Pulong Sampaloc									
46	Longos	Aug.14,10:00P	20.08	1675	July21,1:30A	20.19	1703	May23,5:00P	14.13	320
47	Poblacion									
48	Pungo									
49	Poblacion									
50	San Miguel									
51	Bebe									
52	Bebe									
53	Budbud									
54	Bagbag									
55	San Antonio									
57	Malang									
57	Tibagin									

Table A.5.4 Relation between Peak Gage Height at Sulipan, Apalit, and API

A value of 0.9 is applied for the calculation of API. The number of rainfall stations used for obtaining basin rainfall are not always the same. The arithmetic mean method is used for averaging rainfall over the basin above Sulipan, Apalit. The two factors of Peak Gage Height at Sulipan, Apalit, and API have a good relation, except the value of 1966 as shown in Fig.A.5.3.

Peak Gage Height			
Order of Magnitude of Paek Gage Height	Peak Gage Height (m)	Date	API (mm)
1	5.86	Aug.1, 1972	431
2	5.54	Aug.18, 1974	427
3	5.22	July 24, 1962	369
4	5.11	Aug.15, 1960	375
5	4.42	May 24, 1966	366
6	4.34	Oct.16, 1973	289

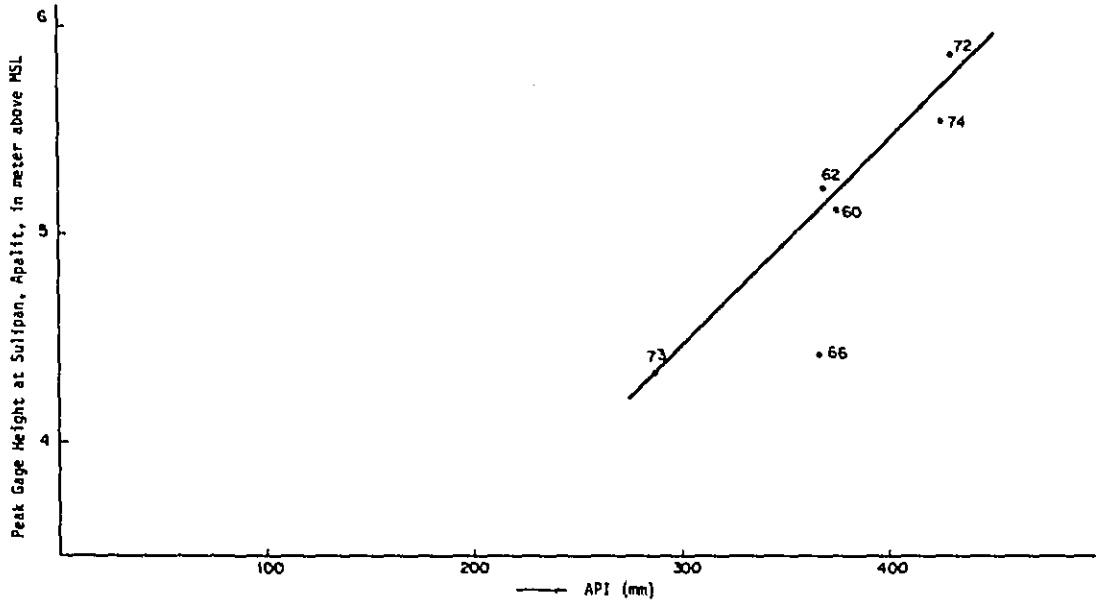


Fig. A.5.3 Relation between Peak Gage Height at Sulipan, Apalit, and API

Table A.5.5 Relation between the Order of Magnitude of Flood Runoff at Sulipan, Apalit, and the Magnitude of Storm Basin Rainfall for Six Major Floods

Total Basin Rainfall			Flood Runoff Volume		Peak Gage Height		
Order of Magnitude	Total Basin Rainfall (mm)	Flood	Order of Magnitude	Flood	Order of Magnitude	Peak Gage Height	Flood
1	1256	July 1972	1	July 1972	1	5.86	Aug. 1972
2	735	Aug. 1960	2	Aug. 1960	2	5.54	Aug. 18 19, 1974
3	677	May 1966	3	may 1966	3	5.22	July 24, 1962
4	629	July 1962	4	July 1962	4	5.11	Aug. 15, 1960
5	553	Aug. 1974	5	Aug. 1974	5	4.42	May 24, 1966
6	375	Oct. 1973	6	Oct. 1973	6	4.34	Oct.18-19, 1973

Remarks: The Order of Magnitude of Flood Runoff Volume was estimated roughly by visual comparison of flood hydrographs and not by calculation.

Table A.5.6 Time Difference between Two Peaks of Hourly Rainfall and Hourly Gage Height at Sulipan, Apalit

The term " time difference between peaks " is used to refer to the time difference between the occurrence of peak rainfall and the corresponding peak gage height. The information on time difference between two peaks on past large floods will be very useful to a flood forecaster, if the previous records are analysed and classified according to rainfall pattern in time and space.

Year	Month and date	Time Difference at Sulipan, Apalit (hr)
1972	July 19-21	59
	July 30-Aug.1	43
1973	Oct.16-18	61
1974	July 20-21	22
	Aug.17-18	29

Table A.5.7 Time of Travel between Two Gaging Stations

The term " time of travel " most commonly refers to the elapse time between the occurrence of a crest at one station and the corresponding crest at a downstream station. The figures show the crest time for selected floods at each station. The time of travel is listed in the following table. This is the case where the intervening swamp between two stations makes hudraulic conditions very complicated.

Flood	Upstream Station		Downstream Station		Time of travel
	No.	Location	No.	Location	
	27	San Agustin	40	Sulipan	
Aug. 1960	Aug 17, 2:00		Aug. 15, 7:00		-31
July 1962	July 23, 17:00		July24, 17:00		24
May 1966	May 22, 17:00		May 24, 7:00		38
July 1972	July31, 7:00		Aug.1, 17:00		34
Oct. 1973	Oct.18, 18:00		Oct.18, 23:00		5
Aug. 1974	Aug.19, 5:00		Aug.18, 20:00		-9

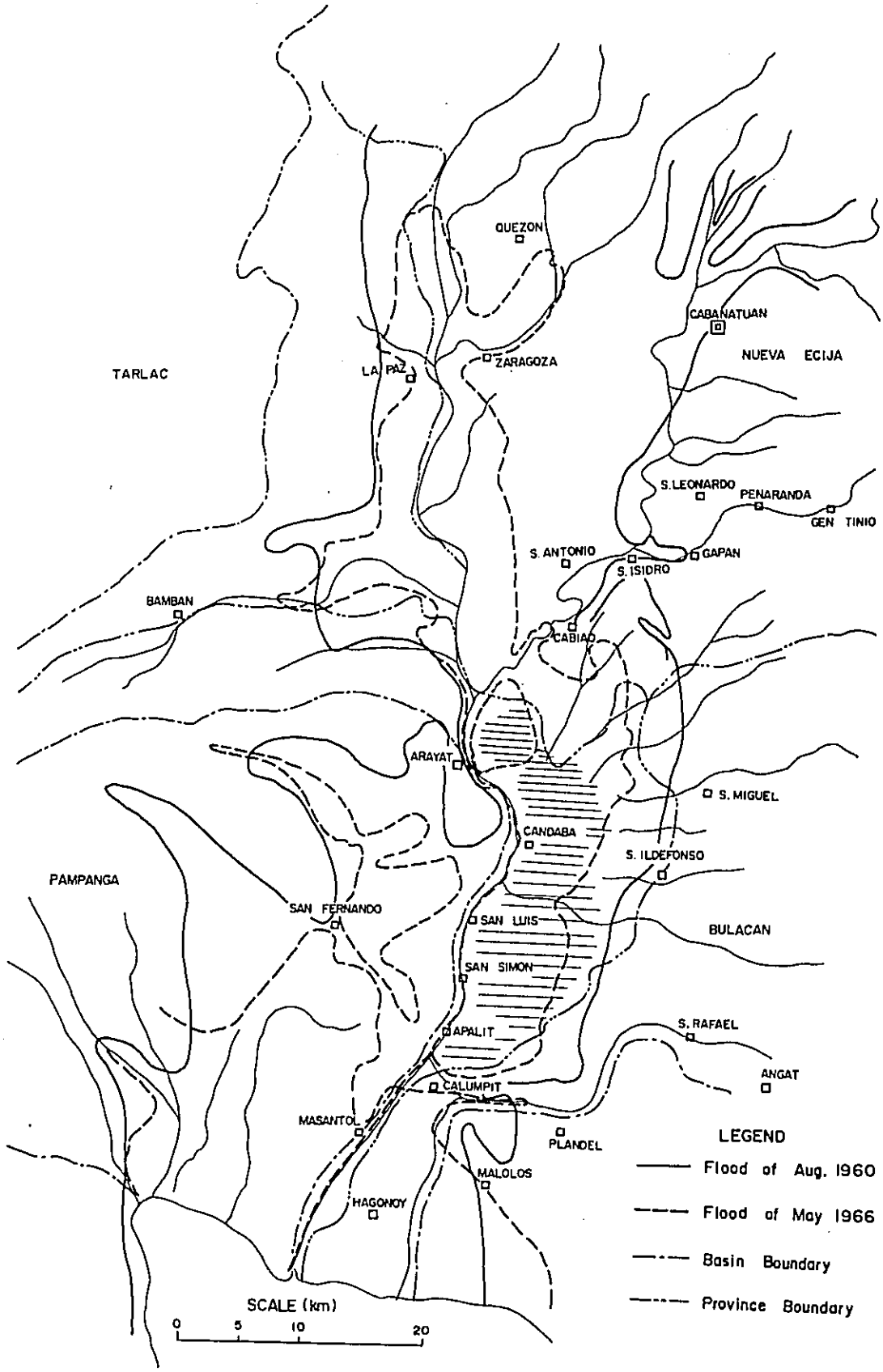


Fig. A.5.4 Flood Limit of Pampanga River Basin
(Flood of 1960 and 1966)

B: Details of Six Major Floods

1. Flood of Aug. 1960
2. Flood of July 1962
3. Flood of May 1966
4. Flood of July 1972
5. Flood of Oct. 1973
6. Flood of Aug. 1974

Flood of 19

			Page
(1)	Weather Record		
(2)	Typhoon Track	Fig.	(P.)
(3)	Rainfall		
	(i) Rainfall Station	Table	(P.)
		Fig.	(P.)
	(ii) Hourly Rainfall	Table	(P.)
		Fig.	(P.)
	(iii) Daily Rainfall (Isohyetal Map)	Table	(P.)
		Fig.	(P.)
	(iv) Basin Daily Rainfall	Table	(P.)
(4)	Gage Height		
	(i) Stream Gaging Station	Table	(P.)
		Fig.	(P.)
	(ii) River Gage Reading	Table	(P.)
	(iii) Hourly Gage Height	Table	(P.)
		Fig.	(P.)
	(iv) Mean Daily Gage Height	Table	(P.)
		Fig.	(P.)
(5)	Discharge		
	(i) Stream Gaging Station	Table	(P.)
		Fig.	(P.)
	(ii) Mean Daily Discharge	Table	(P.)
		Fig.	(P.)
(6)	Peak Time		
	(i) Peak Date and Time (Areal Distribution)		
	(a) Date and Time of Peak Gage Height	Table	(P.)
		Fig.	(P.)
	(ii) Time Difference between Two Peaks		
	(a) Date and Time of Peak Hourly Rainfall, and that of corresponding Peak Hourly Gage Height	Table	(P.)
		Fig.	(P.)
	(b) Date of Peak Daily Rainfall, and Date and Time of Corresponding Peak Hourly Gage Height	Fig.	(P.)
	(c) Date of Peak Daily Rainfall and corresponding Peak Daily Gage Height	Fig.	(P.)
	(d) Hourly Gage Height Hydrograph with Hourly Rainfall at Sulipan, Apalit	Fig.	(P.)
(7)	Flood Record, Damages		(P.)
(8)	Flood Forecasting	Fig.	(P.)

Flood of Aug. 1960

			Page
(1)	Weather Record		
(2)	Typhoon Track	Fig. B.1.1	(P. 42)
(3)	Rainfall		
	(i) Rainfall Station	Table A.4.4	(P. 13)
		Fig. A.4.1	(P. 16)
	(ii) Hourly Rainfall	Table	(P.)
		Fig.	(P.)
	(iii) Daily Rainfall	Table B.1.2-3	(P. 43)
	(Isohyetal Map)	Fig. B.1.2-13	(P. 44)
	(iv) Basin Daily Rainfall	Table B.1.4	(P. 50)
(4)	Gage Height		
	(i) Stream Gaging Station	Table A.4.6	(P. 17)
		Fig. A.4.3	(P. 19)
	(ii) River Gage Reading	Table B.1.5-10	(P. 51)
	(iii) Hourly Gage Height	Table	(P.)
		Fig.	(P.)
	(iv) Mean Daily Gage Height	Table B.1.11	(P. 54)
		Fig. B.1.14	(P. 55)
(5)	Discharge		
	(i) Stream Gaging Station	Table A.4.6	(P. 17)
		Fig. A.4.3	(P. 19)
	(ii) Mean Daily Discharge	Table B.1.12	(P. 54)
		Fig. B.1.14	(P. 55)
(6)	Peak Time		
	(i) Peak Date and Time (Areal Distribution)		
	(a) Date and Time of Peak Gage Height	Table A.5.3	(P. 28)
		Fig. B.1.15	(P. 56)
	(ii) Time Difference between Two Peaks		
	(a) Date and Time of Peak Hourly Rainfall, and that of corresponding Peak Hourly Gage Height	Table	(P.)
		Fig.	( )
	(b) Date of Peak Daily Rainfall, and Date and Time of Corresponding Peak Hourly Gage Height	Fig.	( )
	(c) Date of Peak Daily Rainfall and corresponding Peak Daily Gage Height	Fig. B.1.16	(P. 56)
	(d) Hourly Gage Height Hydrograph with Hourly Rainfall at Sulipan, Apalit	Fig.	( )
(7)	Flood Record, Damages		( )
(8)	Flood Forecasting	Fig.	( )

(1) Weather Record

① TROPICAL STORM AGNES (AUGUST 12 - 14, 1960)

AGNES entered the Philippine Area of Responsibility at 21.0°N 132°E as a tropical storm with maximum winds of 46 mph near the center of August 12. It moved west-northwest for the next 36 hours and recurved northward, then levelled off to the west and later shifted towards the southwest across Formosa. It hit the northeastern coast of the island in the morning of the 14th with center winds of more than 57 mph and left its western coast by the evening of the same day. It became a low pressure area as it moved southwest in the vicinity of Hainan Island on the 16th. This typhoon brought heavy rains over central Luzon as well as Manila which resulted in floods.

② TYPHOON CARMEN (AUGUST 15 - 20, 1960)

This cyclone began as a tropical depression from a low pressure cell 300 miles southeast of Okinawa in the morning of August 15. It gradually intensified as it moved westward reaching its storm stage in the morning of August 17 with maximum winds of 46 mph and center pressure of 990 mbs. It altered its westerly course to northwesterly executing a complete loop in the morning of the 17th. The storm ran into another ridge of high pressure in the morning of the 18th maintaining its northwesterly course, slowed down and further intensified.
It reached typhoon intensity with maximum winds of 72 mph on the same morning recovering from a looped track towards the southeast due to the presence of typhoon "Bess". The coupling effect of typhoon "Bess" moving northwest and "Carmen" moving southeast was relaxed as the distance between the two widened; enabling "Carmen" to proceed northward, leaving the northern limits of the Philippine Area of Responsibility on the 20th towards the east China Sea in a northwesterly course by way of Okinawa.

Monsoon rains accompanied by moderate gusty winds were experienced over the western coastal sections of Luzon and North Western Visayas during its passage.

③ TYPHOON "ELAINE" (AUGUST 21 - 24, 1960)

Typhoon "Elaine" started as a vortex over the South China Sea 200 miles south of Hongkong as early as August 18. It developed into a depression on the 19th as it moved toward the easterly direction. Located midway between Pratas Island and the western boundary of the Philippine Area of Responsibility, "Elaine" reached the storm stage in the evening of the 20th. It attained typhoon intensity in the morning of the 22nd with center winds of 80 mph. It left the PAR cutting through central Formosa in a west-southwest track in the morning of the 24th and degenerated towards China Mainland. Rains and moderate gusty winds over the western coastal sections of Luzon and the Visayas were due to southwest monsoons.

Table B.1.1 Estimated Pressure Values at the Center of Typhoons Aug. 1960

August 1960	Carmen	Elaine
15 00 00 Z	TD 998 mbs	
12 00	TD 996	
16 00 00	TS 994	
12 00	TS 992	
17 00 00	TS 988	
12 00	TS 985	
18 00 00	T 985	
12 00	T 975	TD 998 mbs
19 00 00	T 980	996
12 00	T 975	996
20 00 00	T 975	992
12 00	T 978	988
21 00 00	T 978	990
12 00	T 980	990

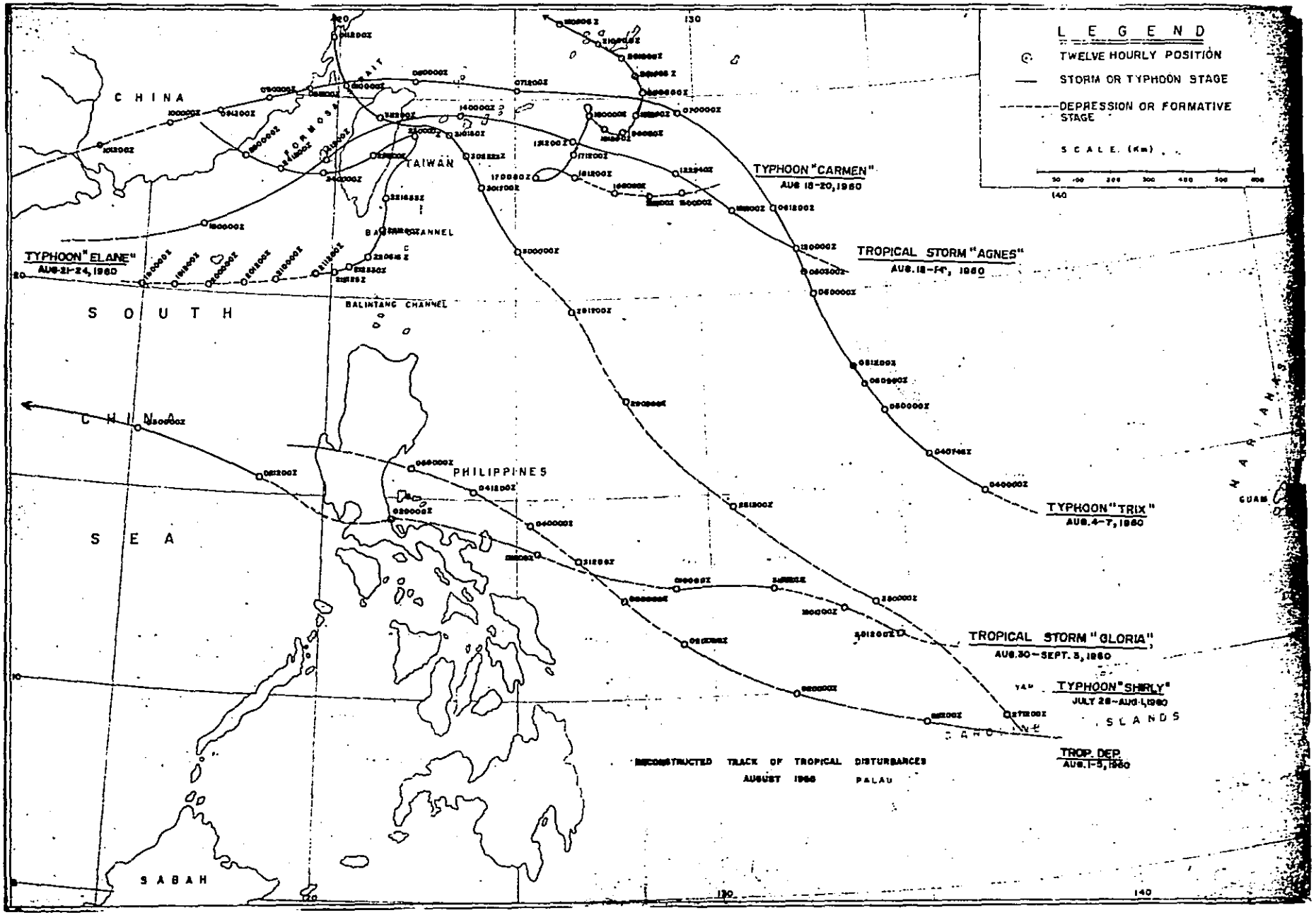


Fig. B.1.1 Typhoon Track Aug. 1960

Table B.1.3 Daily Rainfall (2) Aug. 1960

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — Aug. 1960

No.	31
Day \ Station	Cabanatuan
1	21.8
2	
3	
4	22.8
5	74.6
6	63.2
7	9.6
8	10.1
9	27.1
10	40.6
11	7.8
12	5.0
13	65.0
14	35.0
15	81.2
16	77.2
17	6.6
18	3.3
19	
20	2.2
21	3.8
22	27.6
23	1.0
24	2.2
25	8.8
26	1.2
27	1.5
28	
29	
30	
31	22.0
Total	471.2

Table B.1.2 Daily Rainfall (1) Aug. 1960

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — Aug. 1960

No.	1	4	5	6	7	9	11	12	13	16	17	18	20
Day \ Station	Poblacion	Santor RIS Cuyapa	Santor RIS San Vicente	Bonituan RIS	Lowdoy	Pampanga RIS Arayat	Angat RIS Norzagaray	Harrow Dam	Rizal Dam	Pantranda RIS Main Canal	Pantranda RIS	Dihahuyan Dam	Talavera RIS
1	34.2	2.5	31.2	16.2	78.7	40.1	8.3	30.2	.	8.1	12.9	.	36.5
2	29.2	7.6	18.2	.	21.5	30.7	2.0	.	28.6	1.5	.	41.9	21.0
3	20.3	17.7	5.0	22.8	16.5	50.2	18.5	.	.	10.1	9.9	21.0	6.0
4	3.8	31.7	21.3	15.9	30.6	20.8	44.1	10.9	29.9	6.3	5.3	32.0	99.2
5	33.0	26.6	36.5	81.0	38.1	10.6	21.0	72.6	.	42.6	42.9	89.1	55.6
6	.	53.3	44.1	44.9	67.3	90.4	80.7	70.3	44.9	28.6	44.9	58.1	78.7
7	.	11.4	21.3	14.9	76.2	73.1	44.1	13.4	21.3	2.0	3.0	50.0	89.9
8	32.5	1.2	25.4	15.2	70.3	48.0	17.2	7.1	25.1	3.8	4.0	44.9	80.7
9	41.1	30.4	69.8	51.0	90.9	25.9	70.8	37.0	18.2	28.7	40.1	48.0	105.6
10	35.2	31.7	25.4	55.1	59.6	13.9	0.5	33.7	21.5	23.3	25.9	28.9	81.9
11	16.5	12.7	18.2	14.9	28.8	7.8	25.4	16.0	14.2	11.9	17.0	5.0	16.4
12	15.2	13.9	15.4	2.5	10.9	98.0	43.2	.	25.4	9.6	13.9	9.3	26.4
13	29.2	52.0	77.5	122.9	3.0	116.3	132.0	76.9	39.6	30.7	52.0	90.9	70.2
14	13.9	5.8	22.3	30.9	41.4	160.0	117.8	22.3	19.5	32.7	50.0	.	31.7
15	20.3	17.7	52.3	27.6	27.1	110.2	69.2	41.4	60.6	30.7	35.0	76.9	30.2
16	35.5	38.1	25.1	96.5	62.2	.	75.9	86.8	58.4	65.2	79.9	56.5	67.3
17	29.2	3.8	8.3	1.5	35.5	.	.	14.9	8.3	5.8	1.0	.	4.3
18	56.3	.	6.8	.	6.3	.	.	.	1.0	9.9	.	.	6.3
19	5.0	1.2	8.3	3.0	78.7	36.0	5.5	.	6.8	4.0	3.0	17.0	19.3
20	25.9	12.7	9.1	7.6	32.1	64.0	11.2	.	22.6	13.4	9.9	22.0	19.0
21	33.5	19.0	14.7	7.6	15.7	18.2	15.7	2.7	42.4	11.6	9.9	14.9	11.1
22	30.4	.	60.8	19.4	31.2	.	43.6	16.0	19.0	29.2	43.9	8.8	26.6
23	2.5	6.3	14.4	2.0	5.5	.	9.1	.	1.0	12.7	12.9	.	4.3
24	5.0	.	4.0	.	.	.	.	.	.	12.1	.	.	.
25	11.9	2.5	21.3	.	.	.	3.8	3.3	29.2	22.2	21.0	19.0	18.2
26	.	.	4.5	.	.	.	.	.	.	6.8	.	.	.
27	.	.	.	.	.	.	.	.	.	7.3	.	.	.
28	.	.	.	.	.	.	.	.	.	7.3	.	.	.
29	.	.	.	.	.	.	.	.	.	5.0	.	.	.
30	1.2	.	.	.	.	.	4.3	.	17.0	3.0	.	.	.
31	5.0	.	.	5.0	1.2	34.0	13.2	.	.	3.0	3.0	.	.
Total	564.3	399.8	661.2	653.9	934.7	1018.0	864.9	551.5	550.3	471.5	560.3	730.5	940.5

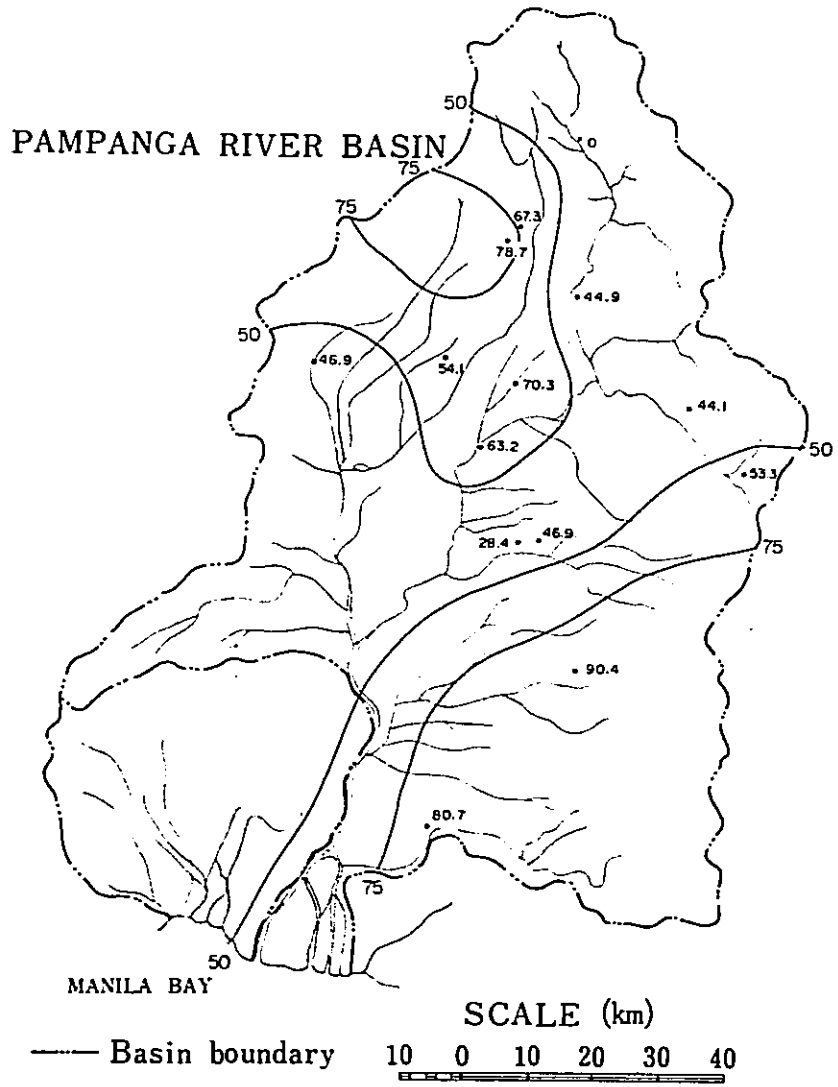


Fig. B.1.3 Isohyetal Map Aug. 6, 1960

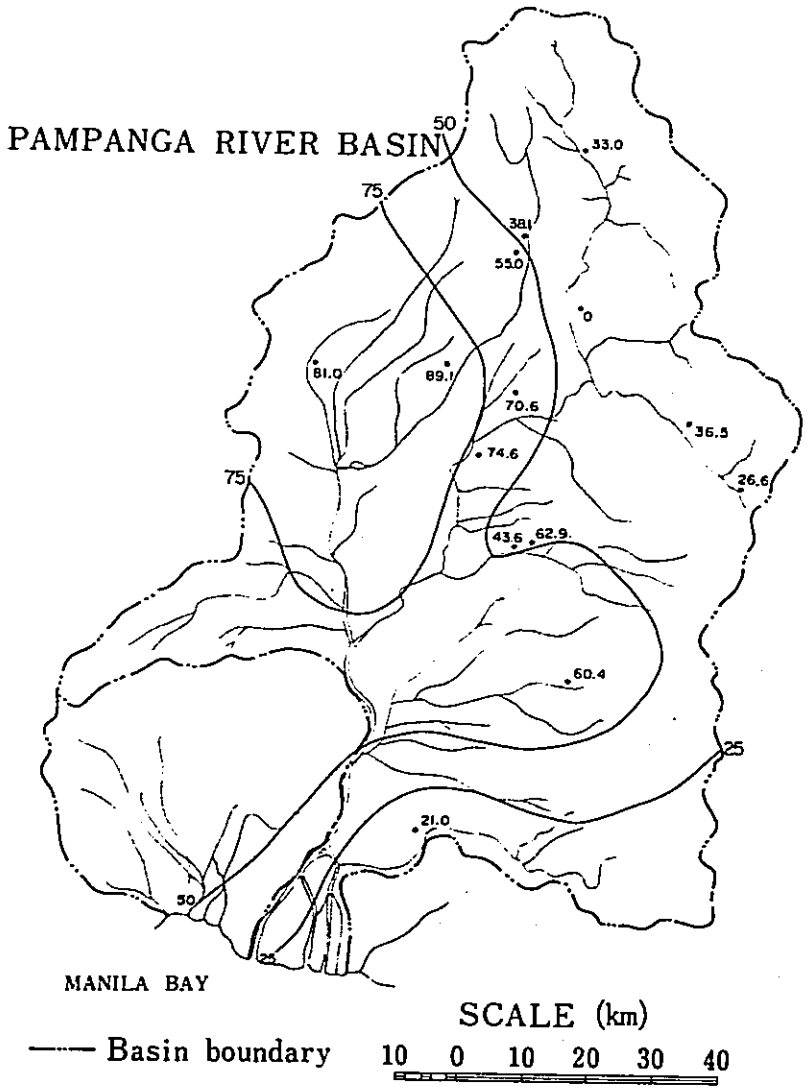


Fig. B.1.2 Isohyetal Map Aug. 5, 1960

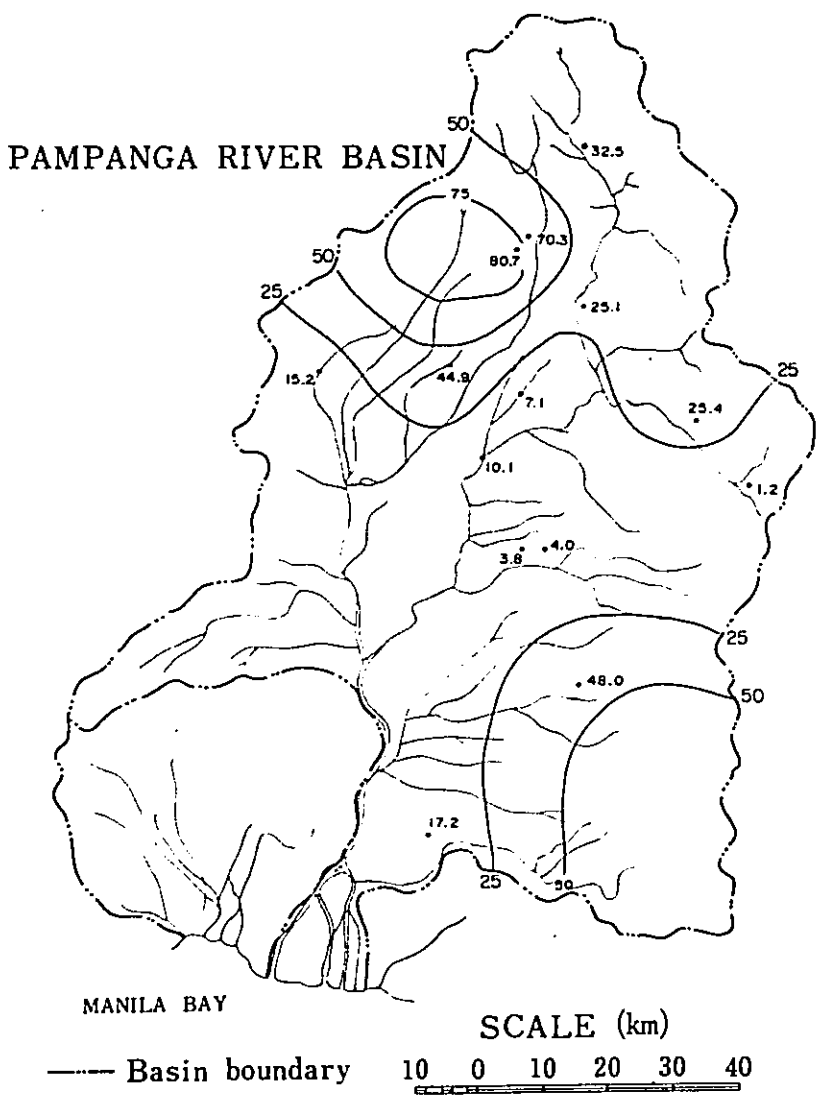


Fig. B.1.5 Isohyetal Map Aug. 8, 1960

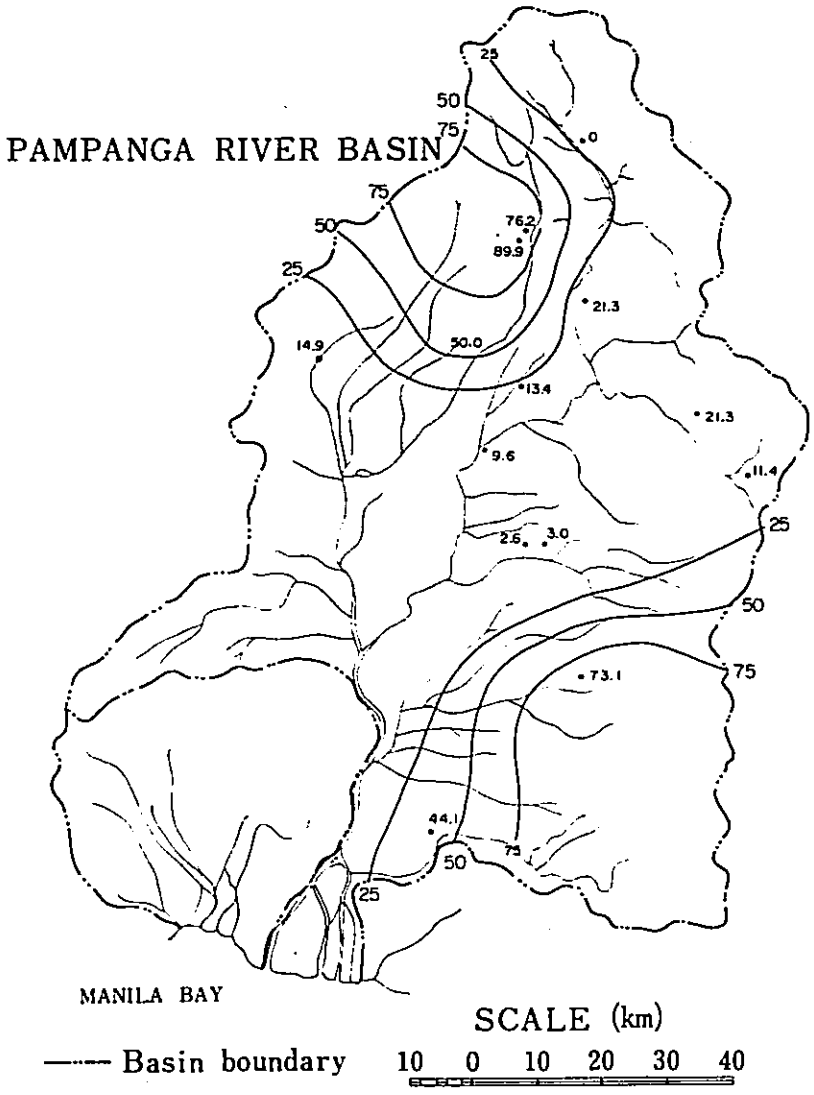


Fig. B.1.4 Isohyetal Map Aug. 7, 1960

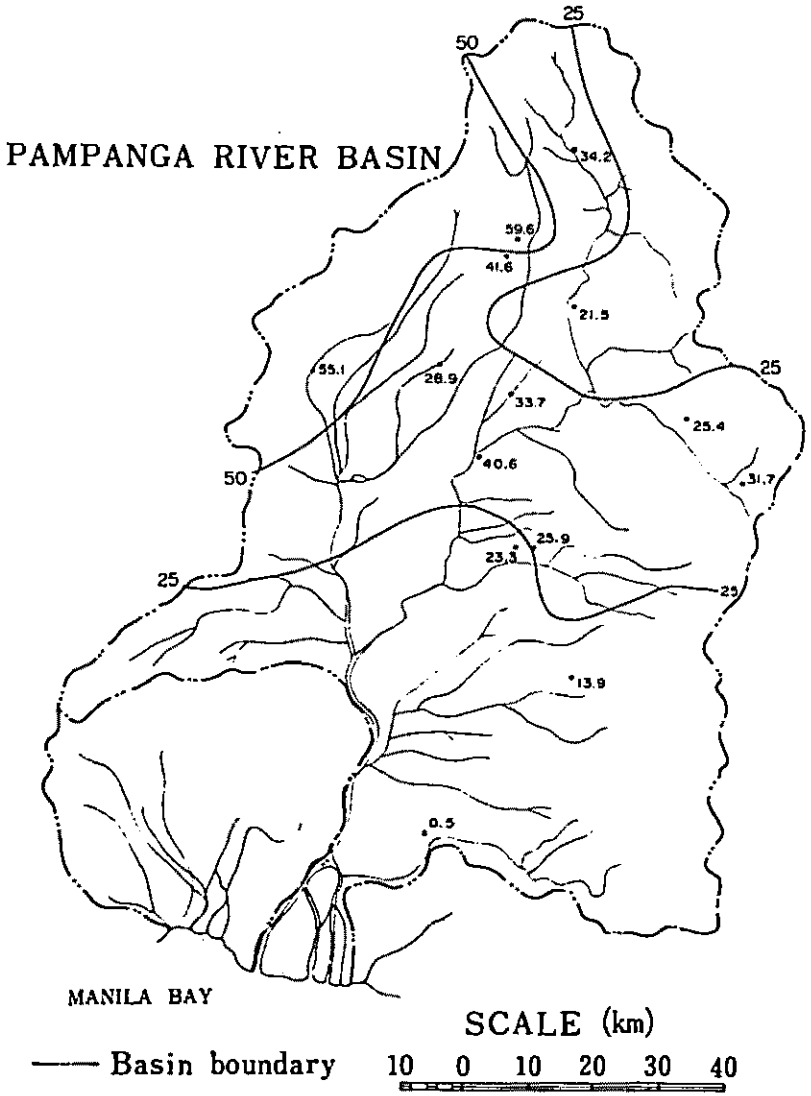


Fig. B.1.7 Isohyetal Map Aug. 10, 1960

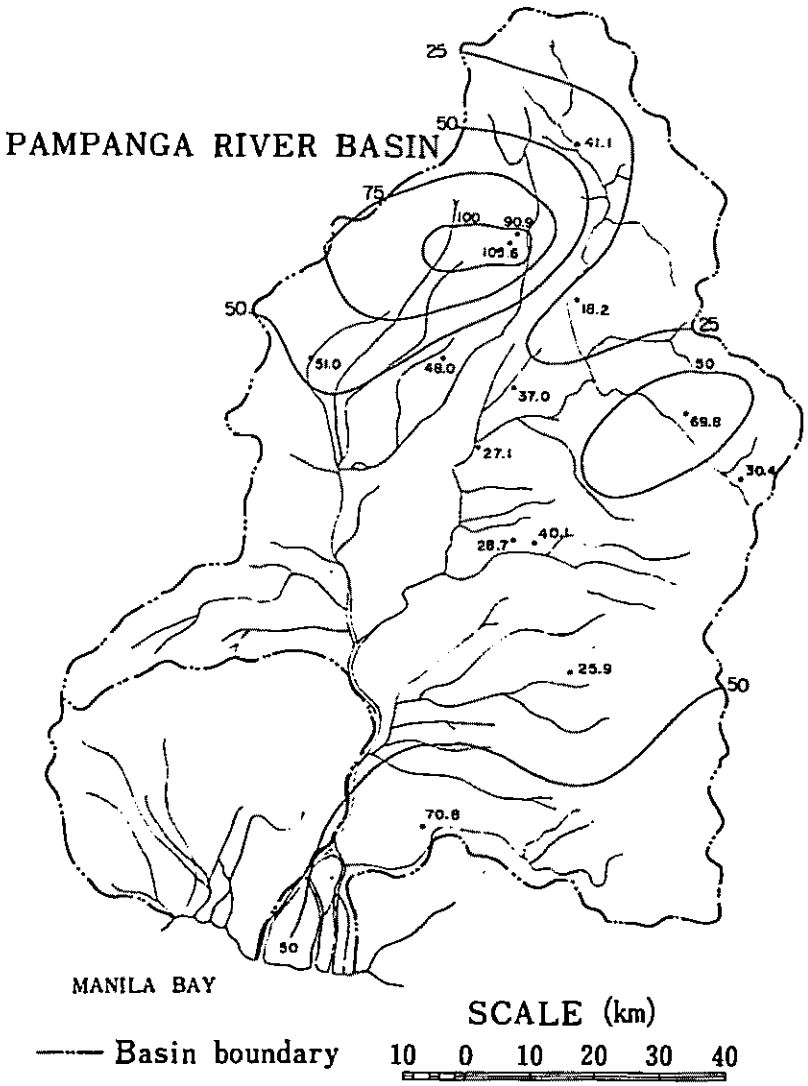


Fig. B.1.6 Isohyetal Map Aug. 9, 1960

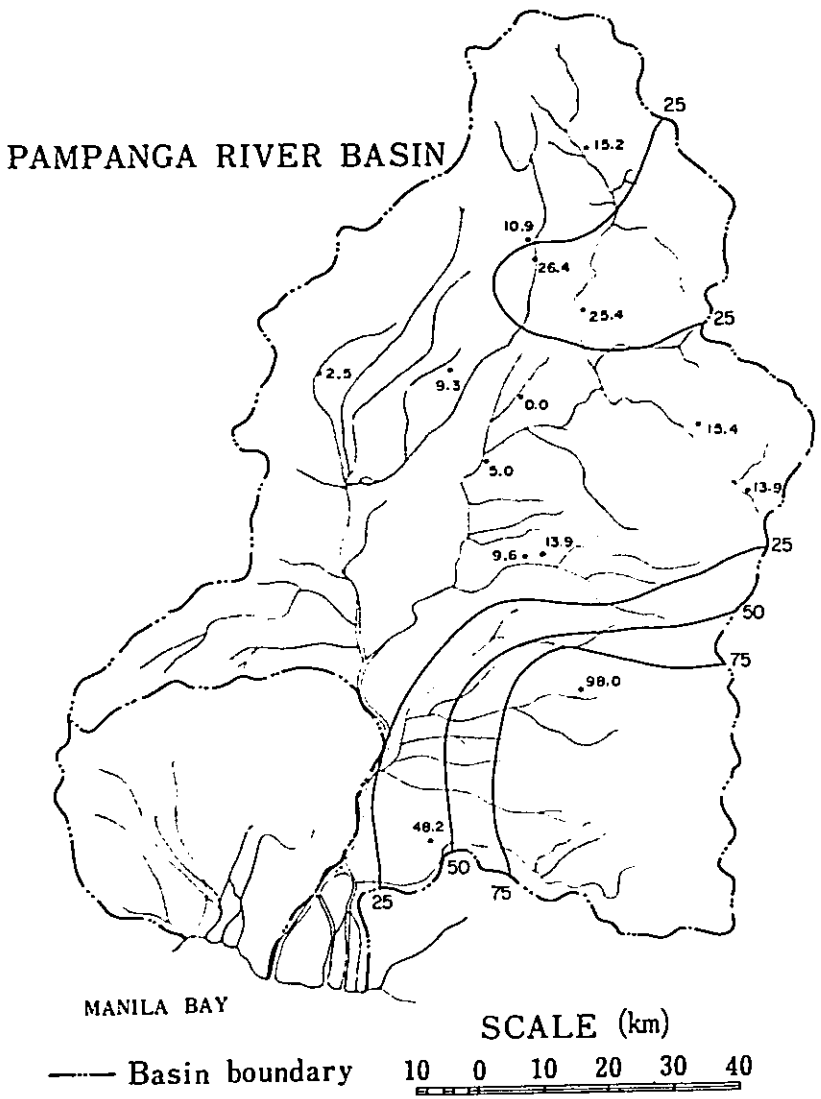


Fig. B.1.9 Isohyetal Map Aug. 12, 1960

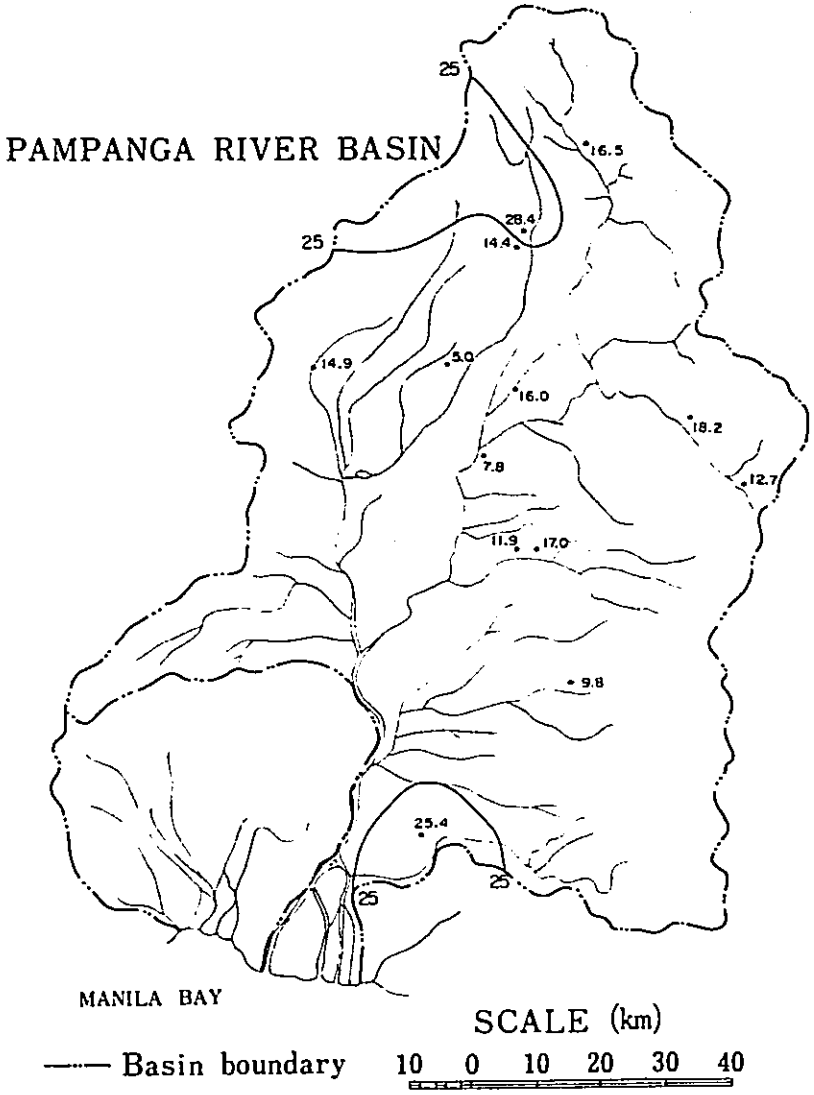


Fig. B.1.8 Isohyetal Map Aug. 11, 1960

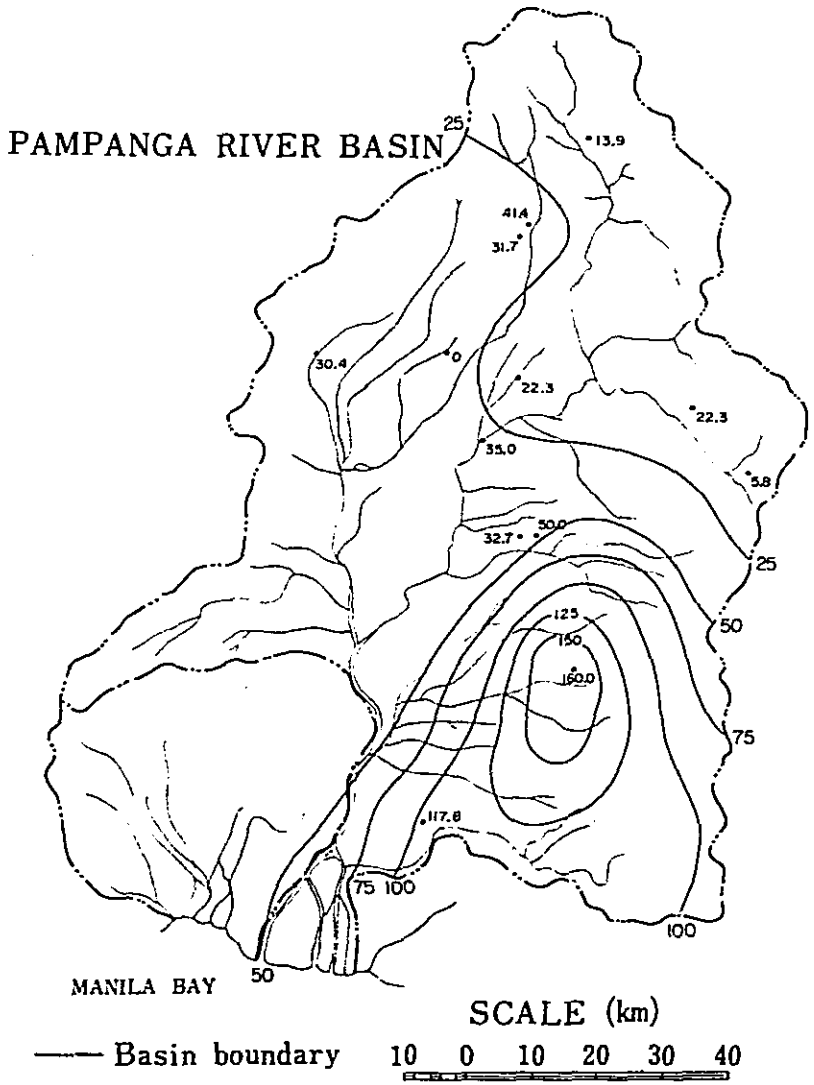


Fig. B.1.11 Isohyetal Map Aug. 14, 1960

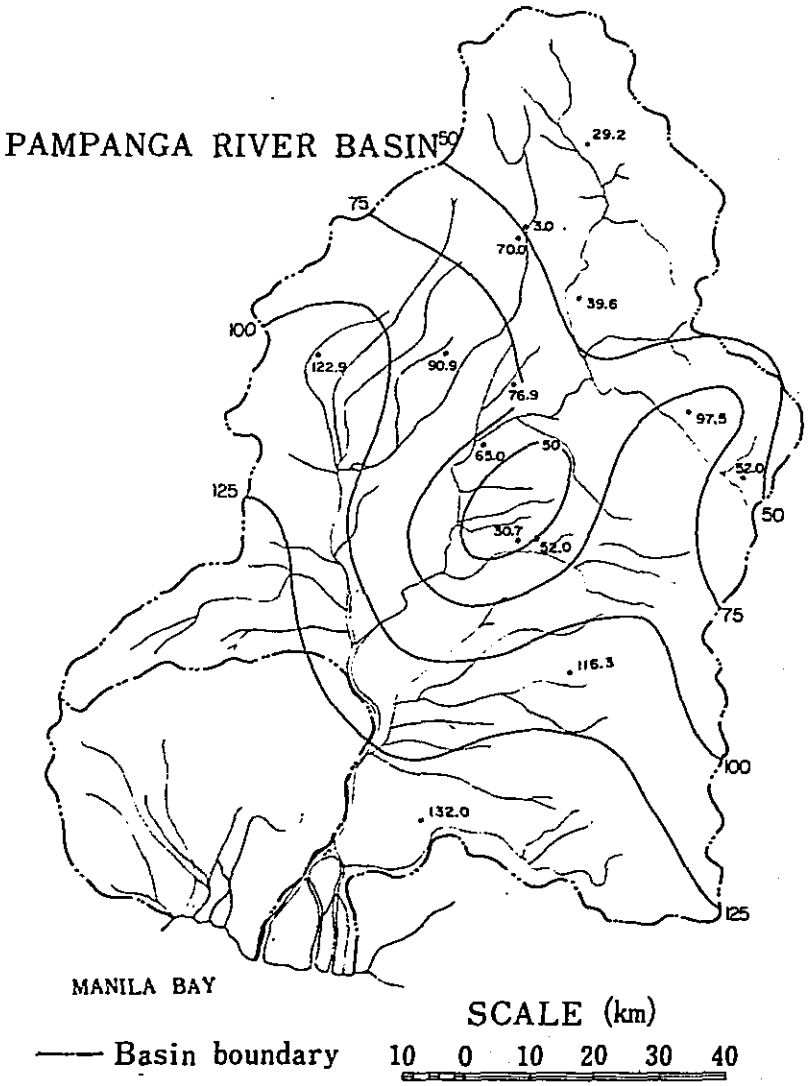


Fig. B.1.10 Isohyetal Map Aug. 13, 1960

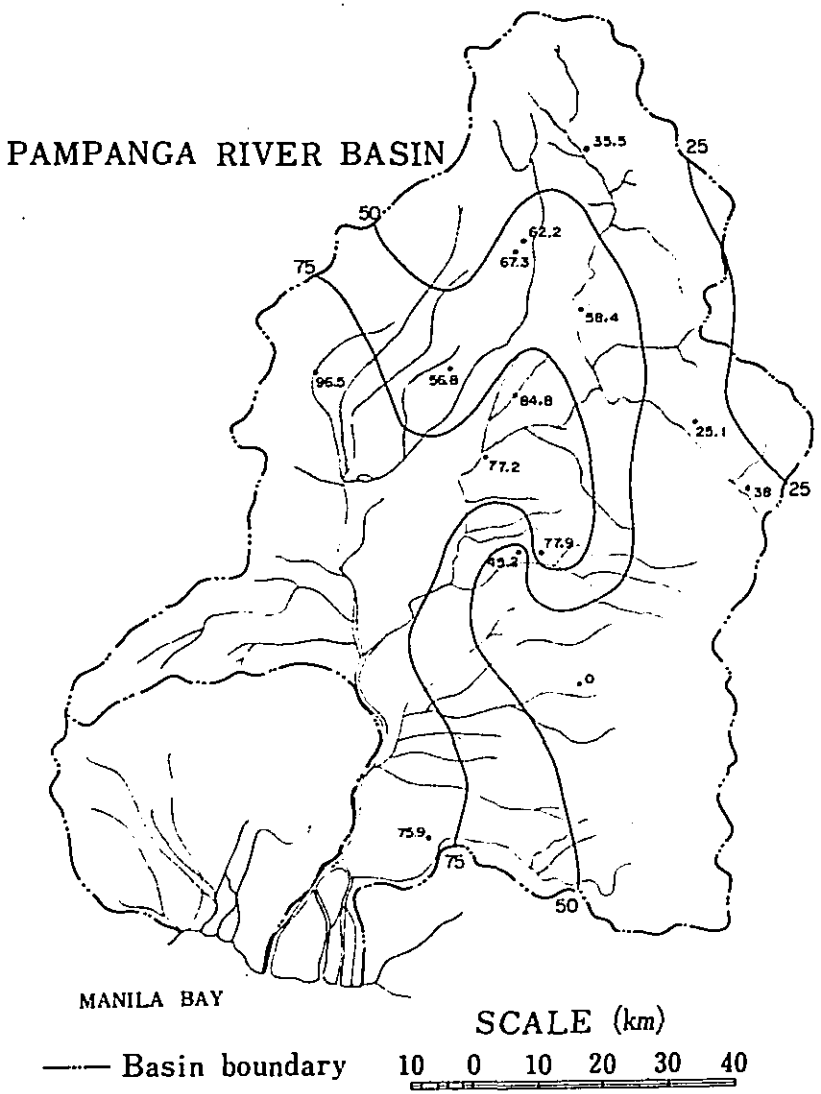


Fig. B.1.13 Isohyetal Map Aug. 16, 1960

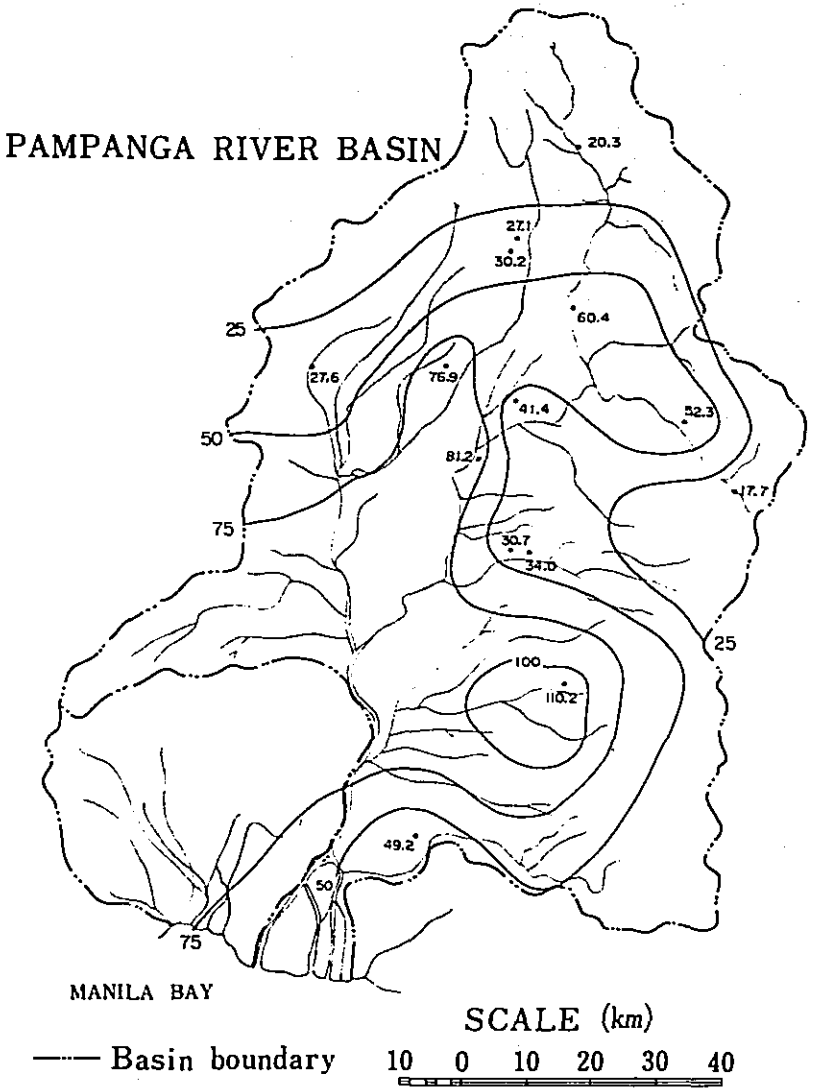


Fig. B.1.12 Isohyetal Map Aug. 15, 1960

Table B.1.4 Basin Daily Rainfall Aug. 1960

Monthly summary of basin daily rainfall (mm)

River System : Pampanga

Aug. 1960

Day \ Gages Station	(1) Thiessen Method	Angat River Basin (A = 935)	Pampanga River Basin (A = 7611)	Whole Pampanga River System (A = 8550)		(2) Arithmetic Mean	Whole Pampanga River System						
1	.	18.1	27.3	26.3	.	.	22.9	.	.	.	.	.	.
2	.	11.1	11.9	11.8	.	.	14.2	.	.	.	.	.	.
3	.	25.0	21.0	21.4	.	.	14.1	.	.	.	.	.	.
4	.	89.8	30.6	32.8	.	.	25.2	.	.	.	.	.	.
5	.	32.7	50.6	49.6	.	.	49.4	.	.	.	.	.	.
6	.	75.0	71.9	72.2	.	.	54.9	.	.	.	.	.	.
7	.	60.0	28.3	31.9	.	.	30.7	.	.	.	.	.	.
8	.	55.3	33.9	36.3	.	.	27.5	.	.	.	.	.	.
9	.	66.4	53.0	54.5	.	.	48.9	.	.	.	.	.	.
10	.	29.4	39.7	38.5	.	.	31.2	.	.	.	.	.	.
11	.	19.8	14.4	15.0	.	.	15.6	.	.	.	.	.	.
12	.	41.5	32.8	36.1	.	.	21.0	.	.	.	.	.	.
13	.	115.8	60.9	67.1	.	.	69.9	.	.	.	.	.	.
14	.	133.3	53.4	62.5	.	.	41.6	.	.	.	.	.	.
15	.	55.2	61.9	61.2	.	.	47.1	.	.	.	.	.	.
16	.	32.3	60.3	57.1	.	.	57.2	.	.	.	.	.	.
17	.	1.5	17.6	15.8	.	.	8.5	.	.	.	.	.	.
18	.	0.7	4.7	4.2	.	.	6.4	.	.	.	.	.	.
19	.	12.4	23.5	22.2	.	.	13.6	.	.	.	.	.	.
20	.	33.2	19.3	20.9	.	.	18.7	.	.	.	.	.	.
21	.	51.7	15.0	19.2	.	.	15.2	.	.	.	.	.	.
22	.	5.7	12.7	11.9	.	.	23.7	.	.	.	.	.	.
23	.	0.4	2.3	2.1	.	.	5.1	.	.	.	.	.	.
24	.	.	4.6	4.1	.	.	1.7	.	.	.	.	.	.
25	.	.	.	.	.	.	11.3	.	.	.	.	.	.
26	.	.	.	.	.	.	0.9	.	.	.	.	.	.
27	.	.	.	.	.	.	0.6	.	.	.	.	.	.
28	.	.	.	.	.	.	0.5	.	.	.	.	.	.
29	.	.	.	.	.	.	0.4	.	.	.	.	.	.
30	.	.	.	.	.	.	1.8	.	.	.	.	.	.
31	.	.	.	.	.	.	0.2	.	.	.	.	.	.
Total	.	946.3	754.6	773.7	.	.	680.0	.	.	.	.	.	.

Table B.1.6 River Gage Reading (2) Aug. 1960

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1960

No.	1		7		9		13		14		15		17	
Gaging Station	Carranglan R.	Baluarte	Coronel R.	Bangkerohan	Cabu R.	Cabu	Chico R.	Ilog na Muntl	Sumacbao R.	Plan	Penaranda R. (N.W.)	San Josef	Penaranda R.	Poblacion
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11			6	3.70			8	2.70	8	1.94	6	30.6	7	5.25
			8	3.64			17	2.60	17	2.00			12	4.96
			17	3.00									17	4.86
12	6	2.13	8	2.69	6	1.45	8	2.40	8	2.00	6	30.4	7	4.60
			17	2.54			17	2.60	17	2.10	17	30.2	12	4.56
													17	4.56
13			8	2.50			8	2.50	8	1.97	6	30.2	7	4.55
			17	2.39			17	2.59	17	1.95	17	30.4	12	4.50
													17	4.60
14			8	2.70			8	2.50	8	3.80	6	31.2	7	5.25
			10	3.86			17	2.52	17	2.15			12	5.50
			17	3.69									17	5.80
15	6	2.34	8	2.75	6	2.40	8	2.80	8	2.07	6	30.6	7	5.30
			17	2.85			17	2.58	17	2.03			12	5.04
													17	5.08
16			8	3.32			8	2.80	8	2.00	6	30.6	7	5.80
			17	3.09			17	2.84	17	4.00			12	5.35
													17	5.60
17	6	2.35	8	4.46	6	3.00	8	3.40	8	3.44	6	31.6	7	6.50
			10	4.60			17	2.96	17	3.22	17	31.8	12	6.03
			17	3.75									17	5.60
18			8	3.18			8	2.50	8	1.80	6	30.4	7	4.90
			17	2.87			17	2.37	17	1.74			12	4.80
													17	4.71
19	6	2.04	8	2.58	6	2.42	8	2.26	8	1.67	6	30.3	7	4.50
			17	2.42			17	2.19	17	1.56	17	30.2	12	4.50
													17	4.50
20			8	2.35			8	2.10	8	1.44	6	30.2	7	4.34
			17	2.36			17	2.14	17	1.38			12	4.32
													17	4.30

Table B.1.5 River Gage Reading (1) Aug. 1960

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1960

No.	1		7		9		13		14		15		17	
Gaging Station	Carranglan R.	Baluarte	Coronel R.	Bangkerohan	Cabu R.	Cabu	Chico R.	Ilog na Muntl	Sumacbao R.	Plan	Penaranda R. (N.W.)	San Josef	Penaranda R.	Poblacion
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	6	2.25	8	1.48	6	.52	8	2.12	8	1.40	6	30.1	7	4.02
			17	1.34			17	2.22	17	1.85	17	30.4	12	3.98
													17	3.96
2			8	1.46			8	2.02	8	1.55	6	30.2	7	4.04
			17	1.30			17	2.00	17	1.50	17	30.1	12	4.04
													17	4.02
3	6	1.73	8	1.40	6	1.35	8	2.17	8	1.40	6	30.1	7	4.00
			17	1.25			17	2.10	17	1.45	17	30.1	12	3.98
													17	3.96
4			8	1.20			8	2.04	8	1.60	6	30.1	7	3.93
			17	1.19			17	2.15	17	1.72	17	30.2	12	3.94
													17	4.08
5	6	1.64	8	1.33	6	.82	8	2.90	8	3.40	6	30.6	7	4.84
			17	1.46			17	2.39			17	30.4	12	5.02
													17	4.96
6			8	1.67			8	2.54	8	3.05	6	30.4	7	4.60
			17	1.62			17	2.90	17	2.19	17	30.4	12	4.65
													17	4.80
7			7.30	1.49			8	2.45	8	1.97	6	30.4	7	4.75
			8	2.94			17	2.40	17	1.15	17	30.4	12	4.72
			17	2.47									17	4.70
8	6	2.48	7.30	2.98	6	.94	8	2.20	8	1.74	6	30.3	7	4.60
			8	3.08			17	2.29	17	1.94	17	30.3	12	4.50
			17	2.49									17	4.41
9			7.30	3.20			8	2.22	8	1.60	6	30.2	7	4.26
			8	3.49			17	2.24	17	1.44	17	30.2	12	4.24
			17	2.19									17	4.20
10	6	2.38	6.20	3.65	6	2.70	8	2.70	8	2.10	6	30.4	7	5.20
			8	3.60			17	2.50	17	3.00	17	30.4	12	4.90
			17	2.96									17	4.75

Table B.1.8 River Gage Reading (4) Aug. 1960

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1960

No.	38															
Gaging Station	Pampanga R.	Sta. Cruz														
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	7	11.28														
	12	11.54														
	17	11.74														
2	7	11.76														
	12	11.86														
	17	11.90														
3	7	12.60														
	12	12.30														
	17	12.30														
4	7	12.30														
	12	12.40														
	17	12.32														
5	7	12.46														
	12	12.68														
	17	12.88														
6	7	13.30														
	12	13.36														
	17	13.58														
7	7	14.56														
	12	14.78														
	17	14.70														
8	7	15.64														
	12	15.54														
	17	15.56														
9	7	15.46														
	12	15.52														
	17	15.64														
10	7	15.72														
	12	15.78														
	17	15.84														

Table B.1.7 River Gage Reading (3) Aug. 1960

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1960

No.	1		7		9		13		14		15		17	
Gaging Station	Carranglan R.	Maluarte	Coronel R.	Bongkerohan	Cabu R.	Cabu	Chico R.	Ilog na Mumti	Sumacbao R.	Pias	Penaranda R. (N.W.)	San Josef	Penaranda R.	Pahlaclon
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21		.	8	2.80			8	2.09	8	1.39	6	30.2	7	4.40
		.	17	2.40			17	2.34	17	1.34		.	12	4.38
													17	4.36
22	6	2.36	8	2.38	6	1.00	8	2.35	8	2.80	6	30.2	7	4.60
		.	17	2.66		.	17	2.36	17	2.80		.	12	4.62
													17	4.64
23		.	8	2.81		.	8	2.28	8	1.85	6	30.4	7	4.66
		.	17	2.72		.	17	2.45	17	1.69		.	12	4.68
													17	4.78
24	6	2.19	8	2.57	6	1.35	8	2.30	8	1.58	6	30.4	7	4.60
		.	17	2.46		.	17	2.26	17	1.57		.	12	4.58
													17	4.50
25		.	8	2.35		.	8	2.15	8	1.56	6	30.2	7	4.00
		.	17	2.26		.	17	2.20	17	1.52		.	12	4.00
													17	3.95
26	6	1.27	8	2.28	6	1.05	8	2.10	8	1.60	6	30.2	7	3.90
		.	17	2.14		.	17	2.04	17	1.55		.	12	4.38
													17	4.38
27		.	8	2.04		.	8	2.02	8	1.40	6	30.1	7	4.36
		.	17	1.98		.	17	2.02	17	1.35		.	12	4.36
													17	4.34
28		.	8	1.90	6	.80	8	1.98	8	1.32	6	30.1	7	4.33
		.	17	1.82		.	17	1.96	17	1.30		.	12	4.31
													17	4.31
29	6	1.69	8	1.76		.	8	1.91	8	1.28	6	30.	7	4.30
		.	17	1.71		.	17	1.90	17	1.25		.	12	4.30
													17	4.28
30		.	8	1.66		.	8	2.20	8	1.24	6	30.	7	4.26
		.	17	1.63		.	17	1.96	17	1.28		.	12	4.12
													17	4.04
31	6	1.66	8	1.60	6	.65	8	1.80	8	1.22	6	30.	7	3.66
		.	17	1.62		.	17	1.87	17	1.18		.	12	3.64

Table B.1.10 River Gage Reading (6) Aug. 1960

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1960

No.	38									
Gaging Station	Pampanga R. Sta. Cruz									
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21	7	16.14								
	12	16.10								
	17	16.08								
22	7	16.00								
	12	15.98								
	17	15.94								
23	7	15.94								
	12	15.94								
	17	15.94								
24	7	15.94								
	12	15.94								
	17	15.92								
25	7	15.90								
	12	15.86								
	17	15.82								
26	7	15.78								
	12	15.76								
	17	15.74								
27	7	15.68								
	12	15.64								
	17	15.60								
28	7	15.50								
	12	15.48								
	17	15.44								
29	7	15.30								
	12	15.28								
	17	15.20								
30	7	15.00								
	12	14.96								
	17	14.90								
31	7	14.80								
	12	14.80								
	17	14.64								

Table B.1.9 River Gage Reading (5) Aug. 1960

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1960

No.	38									
Gaging Station	Pampanga R. Sta. Cruz									
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	7	15.96								
	12	16.04								
	17	16.08								
12	7	16.18								
	12	16.20								
	17	16.32								
13	7	16.36								
	12	16.36								
	17	16.38								
14	7	16.48								
	12	16.47								
	17	16.58								
15	7	16.64								
	12	16.67								
	17	16.75								
16	7	16.72								
	12	16.78								
	17	16.76								
17	7	16.68								
	12	16.70								
	17	16.70								
18	7	16.70								
	12	16.66								
	17	16.64								
19	7	16.56								
	12	16.50								
	17	16.44								
20	7	16.34								
	12	16.28								
	17	16.22								

Table B.1.12 Mean Daily Discharge Aug. 1960

Monthly summary of mean daily discharge (m^3/s) at different stations

River System : Pampanga

Aug. 1960

No.	3	8	12	18	27	35	46
Day \ Gaging Station	Pampanga R. Tlaloan	Pampanga R. Mapalac	Pampanga R. San Antonio	Pampanga R. San Vicente	Pampanga R. San Agustin	Pampanga R. Paniqui	Angat R. Encinos
1	58.	148.	128.	87.	137.	157.	10.
2	90.	193.	283.	180.	308.	283.	14.
3	80.	168.	267.	188.	400.	385.	8.
4	79.	113.	181.	174.	329.	392.	22.
5	90.	129.	206.	225.	431.	374.	186.
6	103.	352.	670.	315.	601.	630.	166.
7	210.	578.	952.	400.	1015.	908.	452.
8	350.	620.	898.	685.	1232.	1051.	601.
9	590.	617.	931.	700.	1318.	1090.	673.
10	571.	717.	985.	730.	1585.	1151.	778.
11	431.	685.	1096.	770.	1775.	1244.	685.
12	317.	533.	980.	793.	2015.	1227.	585.
13	317.	659.	726.	850.	1973.	1256.	588.
14	520.	795.	976.	870.	1987.	1279.	1213.
15	491.	702.	1290.	857.	2253.	1311.	1170.
16	580.	632.	1170.	880.	2333.	1321.	778.
17	680.	892.	1367.	878.	2346.	1330.	888.
18	443.	652.	1293.	850.	2218.	1317.	576.
19	340.	446.	703.	798.	1987.	1295.	390.
20	388.	462.	507.	770.	1791.	1258.	325.
21	500.	515.	715.	760.	1707.	1186.	647.
22	560.	575.	633.	738.	1651.	1198.	520.
23	592.	632.	734.	710.	1707.	1191.	713.
24	308.	459.	715.	669.	1648.	1181.	495.
25	277.	367.	603.	579.	1661.	1160.	317.
26	250.	358.	891.	557.	1570.	1133.	263.
27	200.	270.	826.	503.	1368.	1095.	236.
28	170.	238.	369.	444.	1078.	1046.	187.
29	150.	195.	312.	392.	944.	973.	169.
30	140.	154.	368.	353.	816.	918.	121.
31	130.	152.	335.	334.	739.	810.	103.
Total							

Table B.1.11 Mean Daily Gage Height Aug. 1960

Monthly summary of mean daily gage height (m) at different stations

River System : Pampanga

Aug. 1960

No.	38	39	40
Day \ Gaging Station	Pampanga Sta. Cruz	Pampanga San Jose	Pampanga Sulipan, Apalit
1	11.22	4.81	11.22
2	11.84	4.84	11.39
3	12.16	5.18	11.64
4	12.26	5.31	11.75
5	12.78	5.66	12.03
6	13.56	6.34	12.45
7	14.82	7.60	13.58
8	15.31	8.10	14.19
9	15.50	8.25	14.32
10	15.77	8.53	14.64
11	16.01	8.78	14.95
12	16.14	8.96	15.14
13	16.19	9.05	15.26
14	16.35	9.23	15.48
15	16.52	9.37	15.61
16	16.75	9.45	15.56
17	16.69	9.50	15.59
18	16.67	9.46	15.57
19	16.50	9.27	15.38
20	16.38	9.02	15.18
21	16.11	8.81	15.00
22	15.97	8.69	14.92
23	15.94	8.67	14.95
24	15.93	8.66	14.87
25	15.86	8.55	14.76
26	15.76	8.45	14.63
27	15.64	8.34	14.48
28	15.89	8.21	14.34
29	15.27	8.04	14.18
30	14.98	7.79	14.00
31	14.70	7.54	13.81

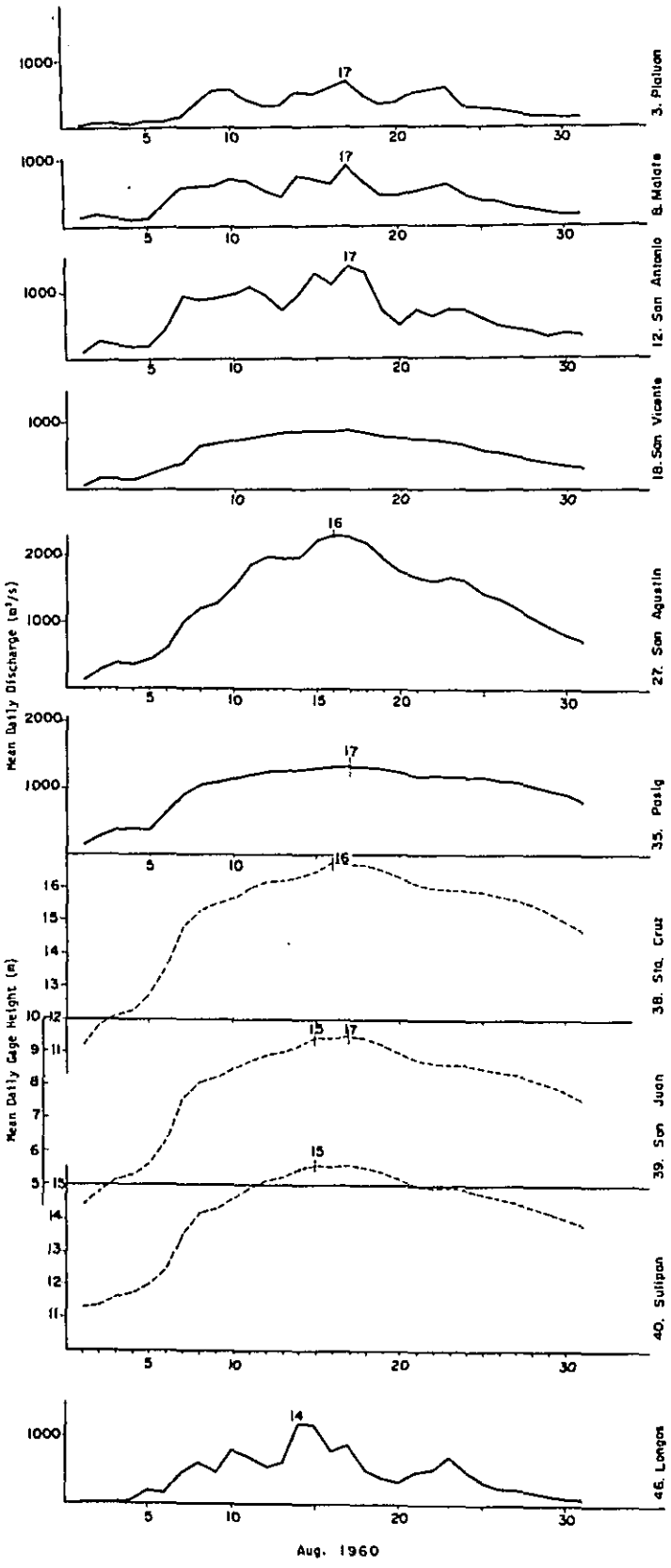


Fig. B.1.14 Mean Daily Gage Height and Discharge Aug. 1960

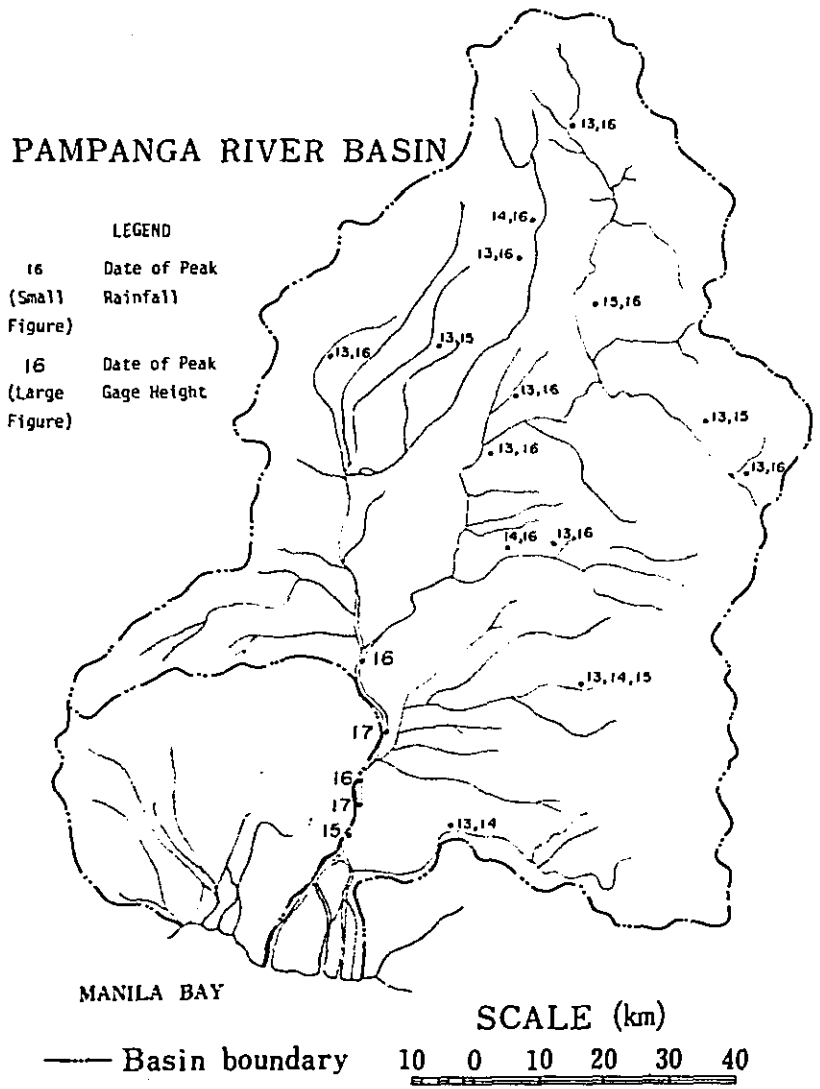


Fig. B.1.16 Date of Peak Daily Rainfall and Corresponding Peak Gage Height Aug. 1960

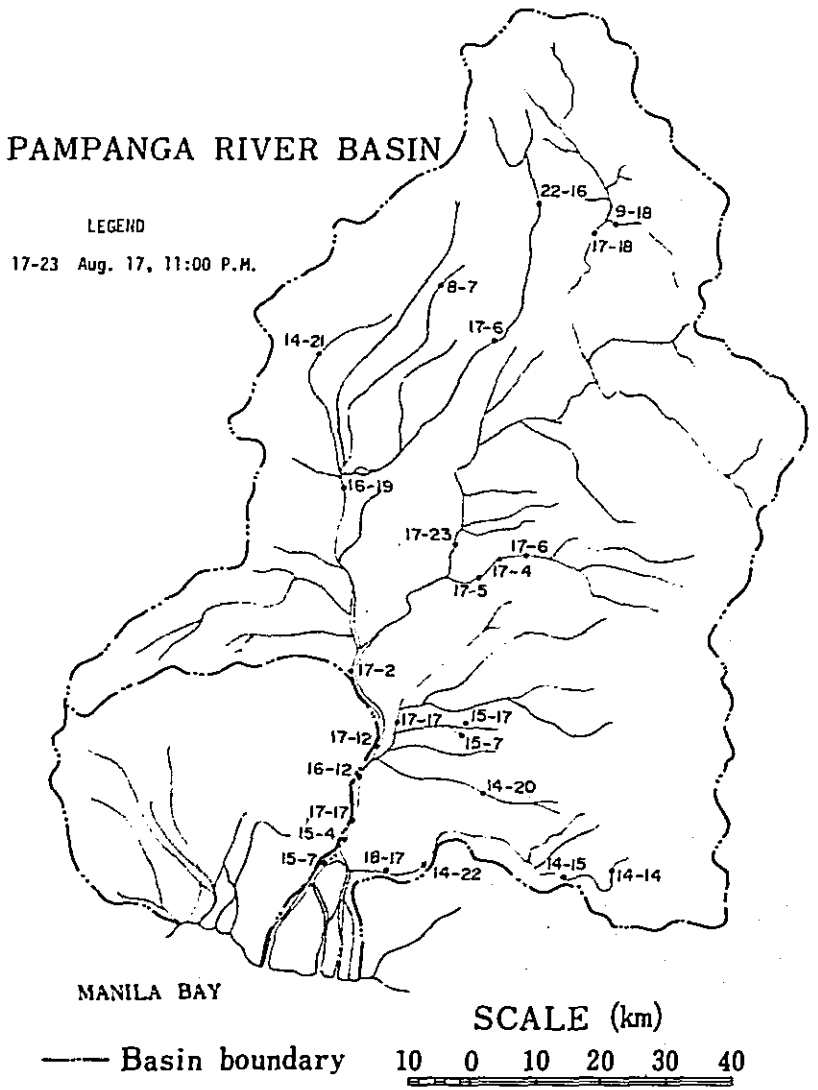


Fig. B.1.15 Date and Time of Peak Gage Height Aug. 1960

(7) Flood Record, Damages

① Outline of the Flood of August 1960

From the view point of the amount of rainfall precipitated on the watershed of the Pampanga River System, the flood of August 10, to 25 in Central Luzon was not of extraordinary magnitude. The rainfall frequency was in the order of once in three years. Its magnitude had been exceeded 16 times in the period 1911 to 1959, but the high water stages it produced in the flood plains above Calumpit and the duration of the flood, clearly show the marked effect of deterioration of outlet channels in the lower delta of the river basin and the utter inadequacy of present outlets through the constricting bridges on the highway and railroad embankments between Bagbag and Apalit. The rise of the flood level in the Candaba swamp in the vicinity of Arayat, to within one meter of the design flood level for a 100-year flood, further serves to point out dramatically, that dyking and channel improvements on the Pampanga river upstream of Apalit, have reached the point of maximum returns and emphasizes the vital and urgent need for the construction of adequate outlets or floodways to connect the Candaba swamp to the Manila Bay. The high water stages caused by this flood in the Candaba swamp despite the fact that the rainstorm which produced the flood was only of a 3 year magnitude, serves as a warning that the present gaps in the setback levee between San Luis and Apalit, may not be closed unless adequate outlets are constructed to the Manila Bay.
To close these gaps without providing the necessary outlets, will raise flood stages in the Candaba swamp beyond designed levels, and cause overtopping and inevitable failure of the existing six meter high setback levee, between Arayat and Apalit, with attendant damages of catastrophic proportions.
The vital importance and urgency of opening the outlets required cannot be overemphasized. Until these outlets are provided, Central Luzon will continue to suffer heavily from the ravages of floods and the ever increasing damages therefrom. It is a long established fact that flood damages increase not because of increase in the magnitude of floods, but because of the ever increasing number and value of structures and other man-made improvements that are built in the natural flood plains of rivers.

② Typhoons and Rainfall

Preceded by a string of five typhoons occuring in May, June and July which brought copious rains and more or less saturated the watersheds of river basins in Luzon, typhoon Trix ushered in the month of August. The first four days of the month recorded an average accumulated depth of 92 mm of rainfall over the Pampanga river watershed. August 5th, with the vertex of typhoon Trix located about 1400 km. eastnortheast of the watershed, saw heavy rains precipitated on the western slopes of the Zambales mountain range, recording 230 mm at Iba, and tapering down to an average of 50 mm on the western slopes of the Sierra Madre in Nueva Ecija and Bulacan.

August 6th, with typhoon Trix still located to the northeast and moving northwest, produced heavier rains on the watershed with a maximum of 100 mm in the unstream areas of the Angat river. Heavy rains continued pouring on the Pampanga river watershed from August 7th to 10th aggregating for these four days an average depth of 161 mm. On August 11th, with the influence of typhoon Trix having dissipated, a lull in precipitation indicated an average depth of rainfall over the watershed for this day, of 15 mm.

On August 12th, tropical storm Agnes was located 1200 km. to the northeast and its effect on precipitation on the watershed was immediately reflected in a resurgence of high rainfall intensities, especially on the watershed of the Angat river where the average depth of rainfall rose from 62 mm on August 12th to 134 mm on August 14th. Thereafter the rains tapered down gradually for the rest of the month, except for a minor rise in intensity from August 19 to 21 due to the presence of Typhoon Carmen, which followed an erratic path on the Pacific Ocean to the northeast. Average daily rainfall depths over the watershed of the Pampanga river are given in Table B.1.4. It is easily seen that the watershed of the Angat river bore the brunt of intense rainfall during the August storms, recording an average depth of 311 mm for the three day period from August 12th to 14th as compared with 147 mm for the same period over the rest of the Pampanga river system watershed. Very heavy rains were also recorded from August 14 to 16, on the watersheds of the Gumain, Porac, Caulaman, Pasig, and Potrero rivers which drain the eastern slopes of the Zambales range. Run off from these river basins contributed to the raising of flood heights in the delta of the Pampanga river.

Three typhoons (see Fig. B.1.1) caused the flood of August 1960 in Central Luzon. Typhoon Trix saturated the watershed without producing serious river overflows. Typhoon Agnes following closely on its tail, produced the peak flood and typhoon Carmen prolonged it.

③ Flood Stages

The heavy rains of August 13 and 14 produced the peak flood stage on the Angat river at Plaridel bridge in Pulilan, where the water level rose 4.78 meters in the space of 25 hours, starting from elevation 5.30 m. at 9:00 P.M. of August 13 and rising to the peak elevation 10.08 m. at 10:00 P.M. on August 14. The great dampening effect of natural storage in the Candaba Swamp which automatically absorbed this sudden increase in volume of floodwaters from the Angat river, is vividly shown in the hydrograph of this river at Bagbag bridge some 12.5 km. downstream of Plaridel bridge. Within the same period of time which saw a rise of 4.78 m. at Plaridel bridge, the water level of the same river at Bagbag bridge roue by only 0.55 m. reaching the peak level at elevation 4.81 m. at 11:30 P.M. on August 14th and thereafter gradually.

Minor peak stages which later developed at Plaridal bridge namely: a rise of 1.45 m. from elevation 6.20 m. at 5:00 P.M. on August 16 to elevation 7.65 m. at 4:00 A.M. on the following day and a rise of 2.25 m. from elevation 5.00 m. at 12:00 noon of August 22nd to elevation 7.25 m. at 12:00 M.N. of the same day, hardly produced any rise in the water stage downstream at Bagbag bridge.

The San Miguel and Maasim rivers which flow directly into the Candaba swamps from the east, recorded their peak stages on August 14, the former with a rise of 3.80 meters in 29 hours and the latter with a rise of 3.95 meters in 48 hours. For the same period the rise in water level in the Candaba swamp at San Luis amounted to only .40 m., again indicated the great sponging effect of storage in the swamp.

North of the Candaba swamp, the peak discharge of the Pampanga river at San Leonardo, Nueva Ecija occurred on August 17th at 11:00 P.M. recording a rise of 1.42 m. in the period of 35 hours from 12:00 noon of August 16 to a peak at 11:00 P.M. on August 17. The peak discharge of Penaranda river at Gapan, Nueva Ecija occurred on August 17th at 7:00 A.M., recording a rise of 1.53 m. in a period of 24 hours from 7:00 A.M. of August 16th to 7:00 A.M. on August 17th.

At San Vicente, Cabiao, the water level reached elevation 9.90 m. at about 12:00 MN on August 7, at which level the water started flowing into the Cabiao-Candaba Floodway. Flow through this floodway lasted till 6:00 P.M. August 25 when the river water level at San Vicente had receded back to elevation 9.90 m.

The sharp peaks and troughs that characterized the hydrographs of the Pampanga River at San Leonardo and Peñaranda, Nueva Ecija were not reflected in the hydrograph at Arayat bridge, where the graph was relatively flat and the rise and fall of the water stages were gradual. This was to be expected from the tremendous natural storage capacity of the San Antonio and Candaba swamps combined. The peak stage at Arayat bridge was recorded at 2:00 A.M. on August 17 with an elevation of 9.98 m.

The hydrographs at San Luis and Sulipan show similar characteristics, both being flat and little affected by sudden changes in water stages in the tributary streams. The peak stage at Sulipan (elev. 5.04 m. at 5:00 A.M. August 15 occurred earlier than the peak stage at San Luis (elev. 6.31 m. at 12:00 noon August 16) although the latter is located upstream. This apparent discrepancy is explained by the effect of the flood peak of the Angat river which occurred earlier (10:00 P.M. August 14) and was of sufficient magnitude as to cause a substantial rise in water stage at Sulipan.

From August 15th to August 17th the water levels in the Candaba swamp as shown by the hydrographs at Sulipan, San Luis and Arayat, stayed practically at the same elevations, indicating a state of euqality between total inflow and outflow rates during this periods. Stage hydrographs for different gaging stations are shown on Fig. B.1.15.

④ The Arnedo Dike

From August 14th to August 17th the Arnedo Dike for its whole length from Arayat to Apalit, was completely under water, and thereby rendered useless in so far as flood protection was concerned.

⑤ Arayat-Apalit-Masantol Setback Levee

This setback levee which has been under construction since 1939, withstood the flood. Three uncompleted gaps at San Simon and Apalit with an aggregate length of 1590 m. allowed escape of floodwaters into the plains of San Fernando, inundating large agricultural areas and rendering the Apalit-San Fernando Road impassable for more than a week. Conditions in these inundated areas were aggravated by the opening of an additional gap in this levee by the Army, a gap which promptly widened from 5 meters to 100 meters. The most critical section of this dyke was at the location of the fuse plug levee between Arayat and Candaba, where the flood level rose to within .50 m. of the top of the dyke.

⑥ Flood Damages

Immediately after the flood, a damage survey team was dispatched to the ravaged areas to assess damages. Fig. A.5.4 shows the flooded area caused by the Pampanga river system and other adjacent rivers namely the Gumain, Porac, Caulaman, Pasig and Potrero Rivers. The areas affected by the flood flows of the Pampanga river system covers 12 municipalities in the province of Pampanga, 12 municipalities in the province of Nueva Ecija and 8 municipalities in the province of Bulacan. A total of 490 barrios within the three provinces with a population of 525,000 was directly affected by the flood.

In the appraisal of flood damages, only the losses in the Pampanga river system were evaluated. Losses in the watersheds of the Gumain, Porac, Caulaman, Pasig and Potrero rivers were not included, these rivers not being considered part of the Pampanga river system. Two general classes of losses - direct and indirect losses were considered in the survey. Placed under the category of direct losses are damages to physical properties, such as residential, commercial and agricultural buildings, livestocks, agricultural crops, roads, bridges, culverts, etc.. Indirect losses evaluated were the estimated losses in profits incurred by commercial and other business establishments, and losses in man-days of work resulting from interruption caused by the flood. The team finished its field work about October 26, 1960. As assessed, the damage caused by the Pampanga river system during the August flood amounted to ₱ 18,000,000. Table B.1.13 gives a breakdown of this figure.

Table B.1.13 Flood Damage Aug. 1960

Discription of Damages	Flood Damages
A. Pampanga River Proper	
Direct Losses:	
1. Commercial, Residential, Agricultural Buildings, Equipment, etc.	₱ 610,900
2. Non-seasonal crops	696,500
3. Livestocks	599,600
4. Fishing Industry	1,618,900
5. Roads, Bridges, Culverts, Etc.	982,200
Sub-Total	₱ 4,508,100
Indirect Losses:	540,800
Total (Direct & Indirect)	₱ 5,048,900
6. Seasonal Crops:	
Relay	7,063,100
Sugarcane	145,700
Total for Pampanga River Proper	₱12,257,700
B. Rio Chico River	
Direct Losses:	
1. Commercial, Residential, Agricultural Buildings, Equipment, etc.	₱ 305,200
2. Non-seasonal crops	165,600
3. Livestocks	208,100
4. Reads, Bridges, Culverts, Etc.	217,600
Sub-Total	₱ 896,500
Indirect Losses:	356,200
Total (Direct & Indirect)	₱ 1,252,700
5. Seasonal Crops:	
Relay	4,440,200
Sugarcane	12,900
Total for Rio Chico River	₱ 5,705,800
Grand Total for Pampanga River System	₱17,963,500

Analysis of previous maximum storms in the watershed of the Pampanga river system shows that flooding in the area is caused by maximum four-day rainfall. The maximum four-day rainfall in the area during the August flood was recorded during the periods August 13, 14, 15 and 16, with an accumulated depth of 248 mm.. The isohyetal maps for these storm periods are shown on Fig. B.1.2 ∿ 13. Analysis of the August 1960 storm, shows that the maximum four-day rainfall was equaled or exceeded once in three years.

A description of the flood as reported by the Office of the Pampanga River Control Project is given below:

On August 9, water began to overflow the banks in Calumpit, Paombong, and Hagonoy in Bulacán, and in Masantol, Pampanga - towns on the lower reaches of the Angat and Pampanga Rivers. The left and right dykes of the Bebe-San Esteban Cut-off Channel, by then, had been overtopped between Stas. 2-000 and 3-000 and some two hundred hectares of fishponds and about four hundred hectares of ricelands were inundated in the town of Masantol alone. At this juncture, about 8:00 A.M., the gage reading at the Sulipan Bridge in Apalit, Pampanga, was at elevation 3.72 meters above mean sea level.

On August 11, the towns of Calumpit, Paombong, and Hagonoy were already reeling from the devastating impact of the large volume of water coming from the Angat and the Pampanga Rivers. At 9:00 A.M., August 11, 1960, the gage reading at the Sulipan bridge was at elevation 4.35 meters above mean sea level, and was still going up. It was apparent that the Arnedo Dyke would soon be overtopped. With the personnel of the Highway District Engineer and the Army pitching in, sand-bagging of the said dyke was immediately started by this Office from Apalit to Arayat, Pampanga, to stave off the rising waters of the Pampanga River.

The heavy downpour on August 13 and 14 topped off the steady rains of previous days; so that, in spite of attempts of this Office to sandbag breaks spotted on August 13, the Arnedo Dyke was overtopped and many portions of it were soon washed away by the rampaging waters about 5:00 P.M. on August 14.

The flood peak was observed at 6:00 A.M. on August 15, 1960, the gage reading being elevation 4.94 meters above mean sea level at Sulipan Bridge in Apalit, Pampanga; 19.98 meters at Arayat Bridge in Arayat, Pampanga; and 29.85 meters at Valdefuente Bridge in Cabanatuan City.

The whole province of Pampanga except the towns of Angeles and Porac, and part of Mabalacat was inundated because the floodwaters from the Pampanga River and the vast Candaba Swamps found its way out through the three gaps along the Arayat-Apalit Setback Levee at Apalit and San Simon, Pampanga.

Transportation along the Manila North Road, otherwise known as Highway 3, was paralyzed from Calumpit, Bulacan to San Fernando, Pampanga. The destruction to roads, bridges, standing crops and private and public properties was great.

The flooded areas where placed under a state of emergency by the President. Consistent with this proclamation, a five meter gap was constracted by the Army without the approval of this Office along the Arayat-Apalit Setback Levee at Sta. 2-100 in the belief of lowering the flood level within the poblacion of Apalit.

While the Pampanga River was wreaking havoc along its path, the rivers emanating from the western part of the province, e.g., the Caulaman Gumain, Porac, Pasig-Potrero, the Abacan, and San Fernando Rivers, including their tributaries, were also belching forth large volume of water.

The swollen Caulaman River inundated a total of 24,000 hectares of rich agricultural lands and fishponds in Lubao, Pampanga, and Hermosa and Dinalupihan in Bataan. Traffic along the Bataan-Pampanga National Road was suspended for two weeks.

On the other hand, some two hundred hectares of sugarlands, ricelands and residential lots were inundated on the landside of the right dyke of the Caulaman-Gumain Diversion Channel due to poor drainage.

The swollen Santol Creak flooded the poblacion of Floridablanca and practically all the villages so that nothing was spared; the wooden bridge at Bo. Valdez was carried by the swift current of the Porac River until it is smashed against the railroad bridge across the Porac-Gumain Diversion Channel in Bo. Sulib of the same town. The railroad bridge was twisted and rendered impassable for more than a week. Trade and commerce between Floridablanca and the rest of the province was thus cut-off.

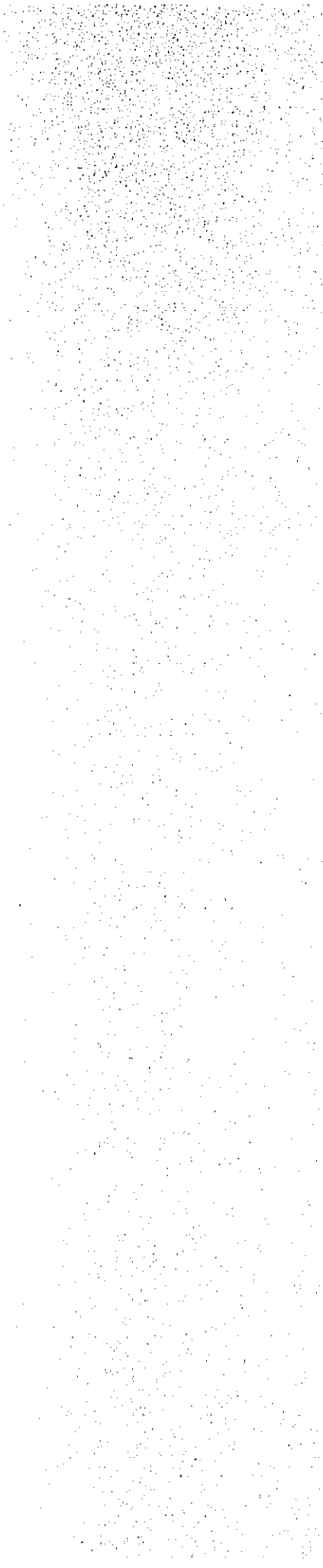
On the whole, the Porac-Gumain Diversion Channel proved capable and efficient in discharging the floodwaters of the combined Gumain and Porac Rivers into the Pasac River despite the enormous scouring of the beaches and excessive siltation of the channel. Nonetheless, at the lower reaches, where the major dykes are not yet completed, the recent flood inundated and damaged all the fishponds on both sides of the project. That section of the left dyke from Sta. 5-800 to 6-000 was further eroded that it is felt, another flood of equal magnitude may cause its total failure. The progressive barrio of Remedios, Lubao, Pampanga, with a population of more than 15,000 will be rendered homeless if such catastrophe should come to pass again.

The town of Lubao and all its northeastern barrios were inundated not by the Porac-Gumain-Caulaman Rivers but by the floodwaters which came from the Pampanga River and the Candaba Swamps through the gaps of Arayat-Apalit Setback Levee.

The swollen Pasig-Potrero River inundated the towns of Sta. Rita, Bacolor and Guagua through breaches on both dykes of Sapang Baluyut Diversion Channel. Flooding of the said towns was aggravated by the floodwaters from the Pampanga River and the Candaba Swamps.

In Angeles, Pampanga, the approach of the reinforced concrete bridge going to Magalang was washed away by the swirling waters of the Abacan River. Traffic was disrupted for one week. The Quitangil River which discharges into the Rio Chico River on the other hand, carried away the approach of the Quitangil Bridge in Mabalacat.

Although buses going to the north short-circuited through Talavera and Guimba, actually six towns of Nueva Ecija were isolated for more than two weeks during the flood. They were the towns of Licab, Quezon, Sto. Domingo, Aliaga, San Antonio and Cabiao, because all roads leading to them were rendered impassable.



Flood of July 1962

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(7)	Flood Record, Damges	Fig.	( )
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(1) Weather Record

There were four tropical disturbances noted for July 1962, although only three gave appreciable rains that caused flooding of the Pampanga River Basin.

① TYPHOON "JOAN" (JULY 7 - 9, 1962)

Typhoon "Joan" started as a tropical depression with maximum winds of 35 mph near the center at 315 miles southeast of Okinawa in the afternoon of July 6. It moved northwest at 6 mph due to the presence of a pressure trough to the northwest and intensified into a storm with maximum winds of 55 mph. It attained typhoon intensity with maximum winds of 80 mph in the morning of July 9 and 4.78 inches of 24 hour rainfall at Iba, Zambales was recorded. "Joan" continued moving northwest until it went out of the Philippine Area of Responsibility. It finally dissipated over the sea of Japan. Rains and gusty winds over Luzon and the Visayas were due to the intensification of the southwest monsoon.

② TYPHOON "KATE" (JULY 8 - 23, 1962)

"Kate" started as a low pressure area 600 miles south of Guam in the Afternoon of July 6. It moved in a west-northwest direction until it intensified into a tropical depression with maximum winds of 30 mph as it reached the Philippine Area of Responsibility. It changed its course to northwest in the morning of 11th as it slowed down the next day. It passed about 100 miles east of Catanduanes on the night of the 14th. After two days, it degenerated to into a broad low pressure area but however reintensified into a depression in the afternoon of July 18 with maximum winds of 30 mph, 290 miles of Tuguegarao. It maintained its northwest movement intensifying into a storm with maximum winds of 40 mph when it was 60 miles north of Cagayan province. From here it changed its movement to an almost westerly direction passing through the Balintang Channel. "Kate" became a typhoon on July 20 giving 12.58 inches of rainfall for a 24 hour duration over Dagupan with maximum winds of 75 mph. The next day it attained maximum surface winds of about 85 mph making a loop and finally moved towards Formosa on the 22nd. It dissipated over China Mainland on the 25th.

③ TYPHOON "NORA" (JULY 26 - 31, 1962)

Cyclone "Nora" started as a low pressure area in the vicinity of Guam as early as July 20. It developed into a depression centered about 750 miles east of Legaspi City as it moved northwest at 12 mph. It veered to the north on the 28th and slowed down to 6 mph, being affected by a westerly trough to the north. It intensified into a storm with maximum winds of 40 mph at 580 miles east of Aparri on the 29th. It continued its northwest movement developing into a typhoon with maximum surface winds of 75 mph at 530 miles northeast of Basco. It went out of the Philippine Area of Responsibility in the afternoon of the 31st. Intensification of the southwest monsoon gave considerable rains of 7.50 inches for a 24 hour duration over Coron, Palawan.

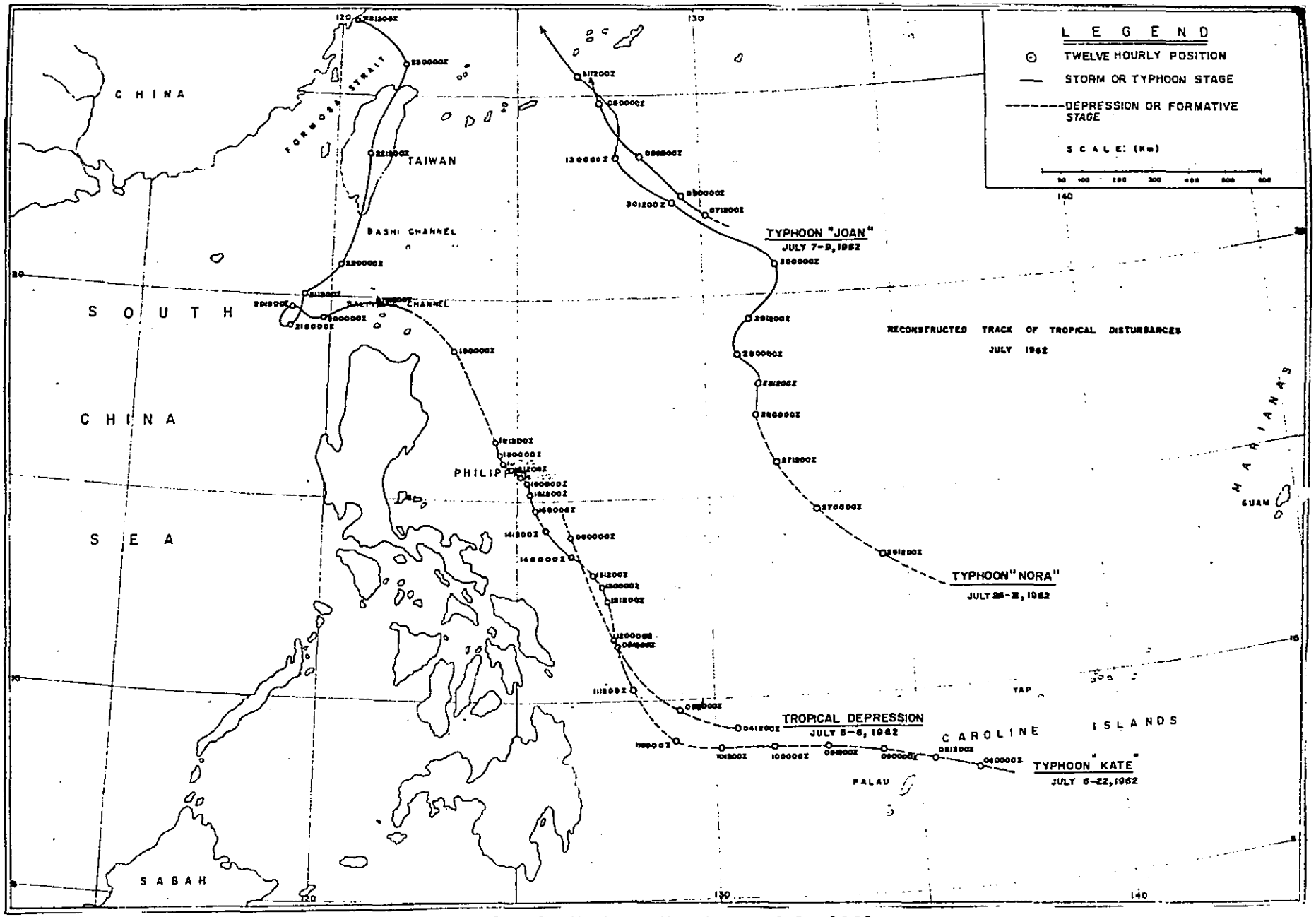

Fig. B.2.1 Typhoon Track July 1962

Table B.2.1 Daily Rainfall July 1962

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga

July 1962

No.	31	8	11													
Day \ Stations	Cabanatuan	San Agustin Arayat	Angat RIS Bustos	Manila												
1	.	25.4	1.0	.												
2	.	35.8	3.0	.												
3	0.3	.	0.3	.												
4	42.7	0.8	4.1	4.3												
5	.	.	0.5	0.3												
6	1.8	.	2.0	.												
7	4.8	.	19.3	.												
8	7.9	0.5	5.6	168.9												
9	3.8	8.9	21.3	29.0												
10	2.8	2.5	18.0	19.8												
11	0.3	.	5.8	11.4												
12	23.6	2.5	31.5	.												
13	1.3	16.5	3.0	.												
14	1.5	0.5	7.4	.												
15	.	.	.	21.1												
16	1.0	.	2.3	25.1												
17	2.8	1.3	0.5	20.8												
18	2.8	5.1	19.8	54.6												
19	54.6	127.0	169.2	107.7												
20	182.4	99.1	211.8	.												
21	52.6	123.2	122.7	.												
22	9.7	3.0	32.5	182.6												
23	35.6	63.0	69.2	198.4												
24	6.4	35.6	34.3	85.3												
25	1.0	1.8	0.8	0.2												
26	.	.	.	.												
27	1.8	0.8	0.5	.												
28	11.2	8.5	15.5	.												
29	6.6	6.9	0.3	38.8												
30	0.5	.	1.5	.												
31	7.4	1.3	2.8	7.8												
Total	468.4	562.0	806.4	970.1												

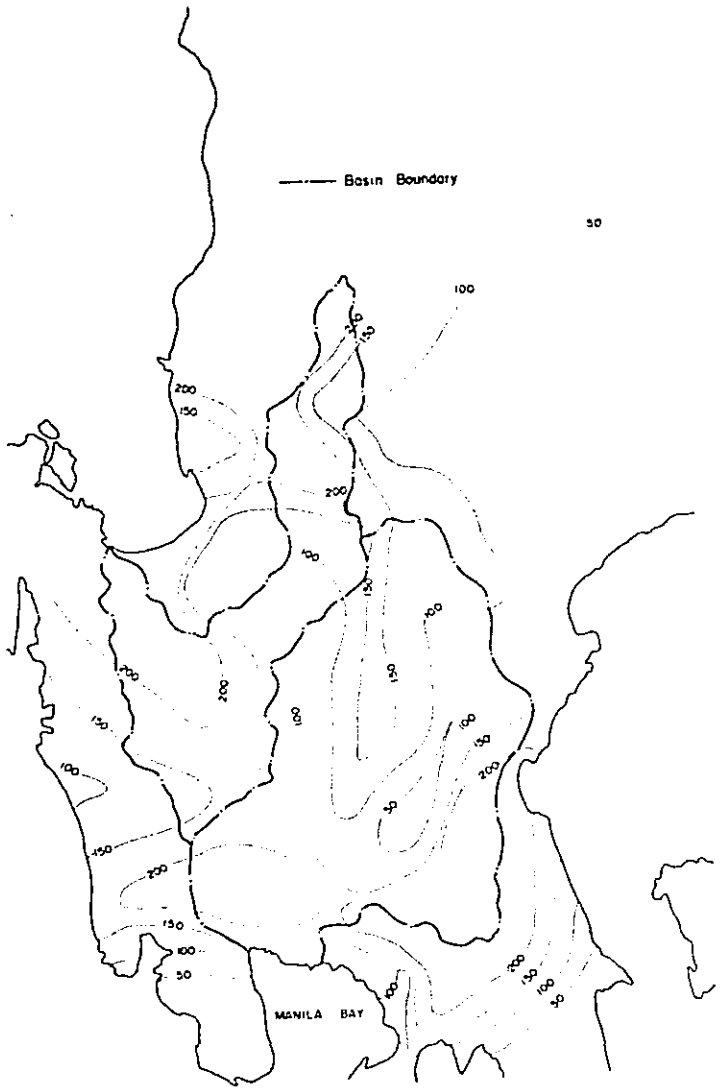

Fig. B.2.3 Isohyetal Map July 20, 1962

Fib. B.2.2 Isohyetal Map July 19, 1962

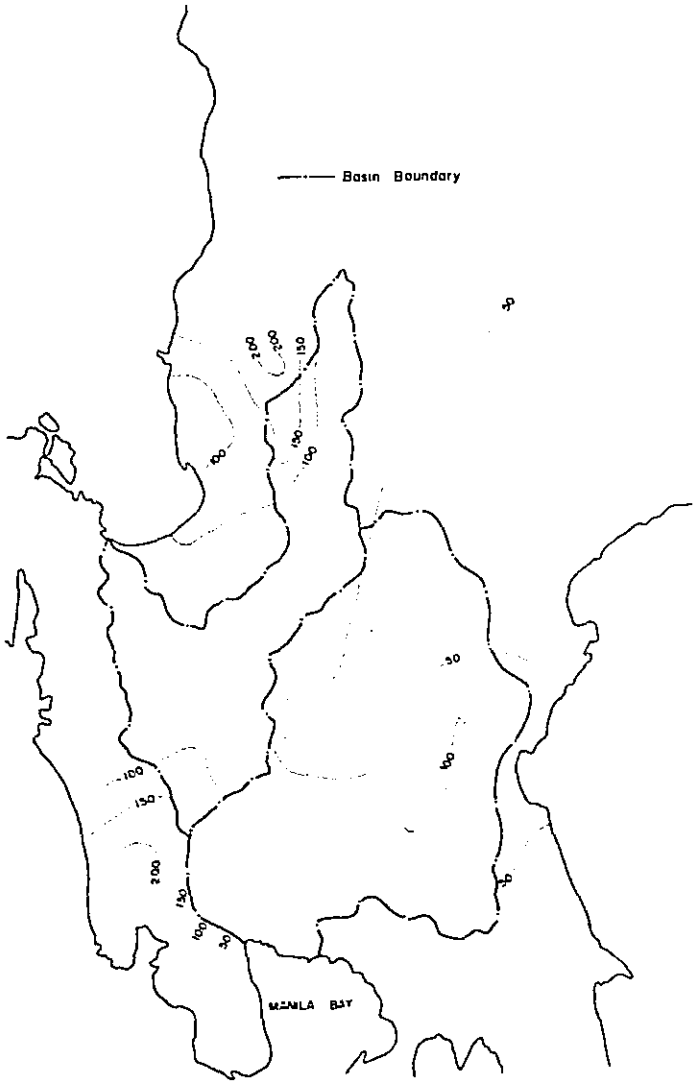

Fig. B.2.5 Isohyetal Map July 22, 1962

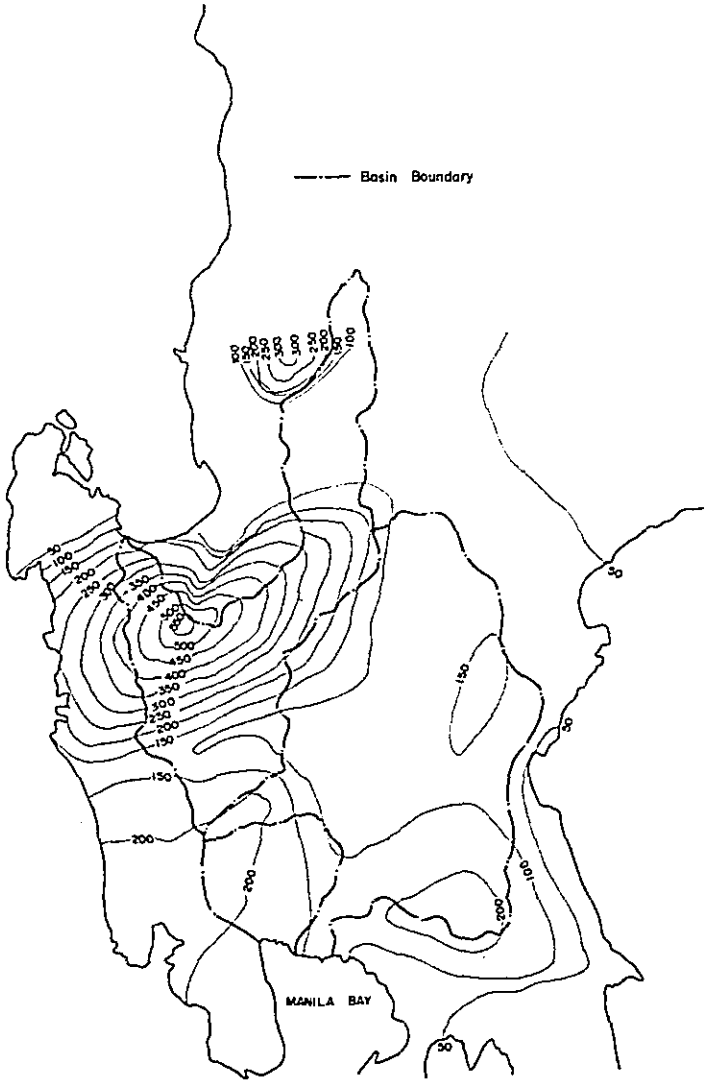

Fig. B.2.4 Isohyetal Map July 21, 1962

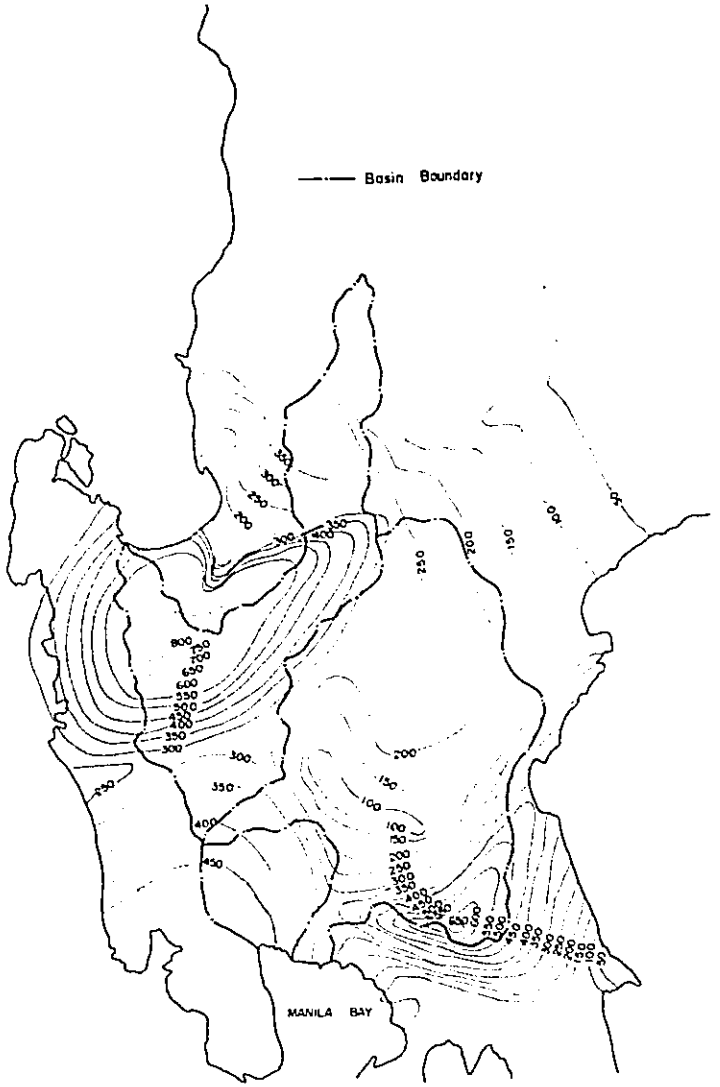

Fig. B.2.6 Isohyetal Map July 20-21, 1962

Table B.2.3 River Gage Reading (1) July 1962

10-day summary of river-gage reading at different stations

River System : Pampanga — July 1962

No.	1		5		6		7		9		13		14	
Gaging Station	Carranglan R.		Santor R.		Santor R.		Coronel R.		Cabu R.		Chico R.		Sumacbao R.	
		Baluarte		Cuyapa		San Vicente		Bangkerohan		Cabu		Ilog na Munti		Plan
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1							8	0.80			8	1.43	8	0.97
							17	0.79			17	1.43	17	0.99
2	6	1.57	7	1.08	7	1.56	8	0.80	6	0.20	8	1.47	8	1.07
							17	0.82			17	1.47	17	1.04
3							8	0.82			8	1.46	8	1.00
							17	0.82			17	1.45	17	0.94
4	6	1.63	7	1.06	7	1.48	8	0.81	6	0.15	8	1.44	8	1.00
							17	0.81			17	1.43	17	1.06
5							8	0.81			8	1.43	8	1.02
							17	0.80			17	1.43	17	1.00
6	6	1.61	7	1.06	7	1.48	8	0.80	6	0.17	8	1.44	8	0.99
							17	0.80			17	1.44	17	0.99
7							8	0.83			8	1.44	8	0.98
							17	0.82			17	1.44	17	0.97
8							8	0.89			8	1.44	8	1.10
							17	0.86			17	1.44	17	1.02
9	6	1.78	7	1.09	7	1.52	8	0.87	6	0.50	8	1.45	8	0.97
							17	0.87			17	1.47	17	0.96
10							8	0.89			8	1.49	8	0.95
							17	0.89			17	1.49	17	1.07

Table B.2.2 Basin Daily Rainfall July 1962

Monthly summary of basin daily rainfall (mm)

River System : Pampanga — July 1962

Day \ Gaging System (1) Thiessen Method	Angat River Basin	Candaba Basin	Upper and Middle Pampanga River Basin	Bocaue R. Basin	Pampanga R. Basin Excluding Angat R. Basin		Whole Pampanga River Basin
1	27.4	27.3	5.3	5.2	9.5		11.4
2	15.2	8.5	0.7	10.2	5.7		6.7
3			0.5	0.4	0.4		0.3
4	3.8	6.7	10.5	6.7	8.4		7.9
5	15.5	18.3	6.0	1.2	6.6		7.6
6	7.7	0.4	1.0	0.7	0.8		1.5
7	11.9	2.1	1.2	0.7	1.2		2.3
8	15.2	9.1	35.1	3.4	18.4		18.1
9	14.8	5.0	2.5	3.1	3.2		4.4
10	12.7	11.3	5.0	6.9	6.9		8.0
11	36.1	10.5	18.3	6.7	12.5		14.8
12	6.9	1.4	5.5	3.8	4.1		4.4
13	18.6	39.1	16.4	13.6	19.8		19.6
14	19.8	7.8	2.9	8.0	5.7		7.2
15	2.3	3.4	5.7	3.4	4.4		4.2
16	13.3	0.7	3.4	4.5	3.3		4.4
17	6.2	0.3	2.4	0.4	1.3		1.2
18	3.9	9.7	8.1	4.4	7.0		6.7
19	156.0	59.2	31.4	26.5	35.0		47.7
20	314.9	66.3	87.6	97.0	87.0		111.0
21	235.8	106.4	137.0	116.3	123.4		135.3
22	102	89.5	74.1	56.8	70.7		76.0
23	97.1	96.6	31.1	30.9	43.7		49.3
24	50.3	31.9	8.5	21.0	17.6		21.1
25	62.1	33.7	9.4	13.3	15.5		20.5
26	1.8	2.8	3.2	8.0	4.9		4.6
27	3.0	0.2	5.8	1.9	3.3		3.3
28	7.5	0.5	7.8	17.4	9.9		9.6
29	16.6	2.4	36.6	14.3	21.8		21.2
30	3.5	0.2	0.5	0.2	0.3		0.7
31	25.8	1.4	5.8	1.7	3.5		5.8
Tot.	1361.9	652.7	589.3	488.6	555.2		630.8

Table B.2.5 River Gage Reading (3) July 1962

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1962

No.	1		5		6		7		9		13		14	
Gaging Station	Carranglan R.	Baluarte	Santor R.	Cuyapa	Santor R.	San Vicente	Coronel R.	Bangkerohan	Cabu R.	Cabu	Chico R.	Ilog na Hunti	Sumacbao R.	Pias
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21			15	2.60			8	5.34			8	3.00	8	3.65
							17	4.86			17	2.54	17	3.98
22							8	5.59			17	2.54	8	3.74
							17	4.94					17	2.40
23	6	2.25	7	1.40	7	2.43	8	2.27	6	1.45	8	2.38	8	1.70
							17	2.50			17	2.34	17	1.65
24							8	2.22			8	2.16	8	1.55
							17	1.92			17	2.13	17	1.47
25	6	1.65	7	1.36	7	2.05	8	1.88	6	0.84	8	2.05	8	1.41
							17	1.72			17	1.98	17	1.35
26							8	1.64			8	1.93	8	1.29
							17	1.54			17	1.86	17	1.29
27	6	1.98	7	1.26	7	1.93	8	1.49	6	0.74	8	1.83	8	1.25
							17	1.42			17	1.81	17	1.23
28							8	1.54			8	1.81	8	1.21
							17	1.57			17	1.78	17	1.21
29					7	2.18	8	1.98			8	2.12	8	1.24
							17	1.74			17	2.35	17	1.80
30	6	1.88	7	1.88			8	1.77	6	0.90	8	2.33	8	1.45
							17	1.65			17	2.15	17	1.30
31							8	1.59			8	2.03	8	1.15
							17	1.54			17	1.95	17	1.12

Table B.2.4 River Gage Reading (2) July 1962

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1962

No.	1		5		6		7		9		13		14	
Gaging Station	Carranglan R.	Baluarte	Santor R.	Cuyapa	Santor R.	San Vicente	Coronel R.	Bangkerohan	Cabu R.	Cabu	Chico R.	Ilog na Hunti	Sumacbao R.	Pias
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	6	1.80	7	1.29	7	1.57	8	.87	6	0.30	8	1.49	8	1.00
							17	1.20			17	1.48	17	1.01
12							8	2.05			8	1.52	8	1.06
							17	.97			17	1.51	17	1.14
13	6	1.83	7	1.10	7	1.71	8	.94	6	0.40	8	1.61	8	1.20
							17	1.00			17	1.55	17	1.16
14							8	1.00			8	1.51	8	1.09
							17	.99			17	1.51	17	1.12
15			7	1.08			8	.97			8	1.50	8	1.00
							17	.96			17	1.49	17	0.99
16	6	1.65			7	1.60	8	.95	6	0.27	8	1.49	8	0.99
							17	.94			17	1.48	17	0.99
17							8	.92			8	1.48	8	0.98
							17	.91			17	1.47	17	1.03
18	6	1.85	7	1.12	7	1.59	8	.90	6	0.26	8	1.66	8	1.03
							17	.90			17	1.68	17	1.19
19							8	.90			8	1.70	8	1.08
							17	.94			17	1.69	17	1.08
20	6	2.19	7	1.28	7	1.92	8	1.37	6	0.87	8	2.40	8	1.65
			14	2.10			17	2.04			17	2.50	17	2.20

Table B.2.7 River Gage Reading (5) July 1962

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1962

No.	15		17		38									
Gaging Station	Penaranda R. (U.M.)	San Josef	Penaranda R.	Poblacion	Pampanga R.	Sta. Cruz								
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	6 29.05		7 3.70		7 10.80									
	.		12 3.68		12 11.00									
	.		17 3.50		17 10.70									
12	6 29.05		7 4.00		7 11.00									
	.		12 4.10		12 10.70									
	.		17 4.00		17 10.58									
13	6 29.05		7 4.20		7 10.80									
	.		12 4.50		12 10.48									
	.		17 4.60		17 10.60									
14	6 29.05		7 4.70		7 10.82									
	.		12 4.75		12 10.70									
	.		17 4.80		17 10.50									
15	6 29.05		7 4.30		7 11.00									
	.		12 4.10		12 10.46									
	.		17 4.00		17 11.20									
16	6 29.05		7 4.00		7 10.58									
	.		12 3.90		12 10.50									
	.		17 3.90		17 10.62									
17	6 29.05		7 3.88		7 11.00									
	.		12 3.86		12 10.56									
	.		17 3.94		17 10.50									
18	6 29.05		7 3.82		7 10.50									
	.		12 3.80		12 10.48									
	.		17 3.72		17 11.30									
19	6 29.05		7 4.70		7 10.82									
	.		12 4.50		12 11.52									
	.		17 4.30		17 10.68									
20	6 30.00		7 4.20		7 11.62									
	17 30.50		12 4.10		12 11.50									
	.		17 4.00		17 11.80									

Table B.2.6 River Gage Reading (4) July 1962

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1962

No.	15		17		38									
Gaging Station	Penaranda R. (U.M.)	San Josef	Penaranda R.	Poblacion	Pampanga R.	Sta. Cruz								
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	6 29.00		7 4.20		7 10.72									
	.		12 4.10		12 10.30									
	.		17 4.00		17 10.68									
2	6 29.00		7 4.00		7 10.58									
	.		12 3.80		12 10.50									
	.		17 3.70		17 10.58									
3	6 29.00		7 3.50		7 10.70									
	.		12 3.80		12 10.00									
	.		17 4.00		17 10.00									
4	6 29.00		7 4.20		7 10.82									
	.		12 4.50		12 10.70									
	.		17 4.20		17 10.30									
5	6 29.05		7 4.30		7 11.00									
	.		12 4.20		12 10.80									
	.		17 4.10		17 11.00									
6	6 29.05		7 4.70		7 11.00									
	.		12 4.80		12 10.80									
	.		17 4.60		17 10.70									
7	6 29.05		7 4.40		7 10.90									
	.		12 4.20		12 10.78									
	.		17 4.25		17 10.60									
8	6 29.05		7 4.30		7 11.20									
	.		12 4.05		12 10.90									
	.		17 4.00		17 11.50									
9	6 29.05		7 4.20		7 10.60									
	.		12 4.00		12 10.48									
	.		17 3.92		17 10.56									
10	6 29.05		7 3.96		7 10.90									
	.		12 3.90		12 10.68									
	.		17 3.76		17 10.58									

Table B.2.9 Mean Daily Gage Height July 1962

Monthly summary of mean daily gage height (m)
at different stations

River System : Pampanga — July 1962

No.	38	39	40
Day \ Gaging Station	Pampanga Sta. Cruz	Pampanga San Juan	Pampanga Salipan, Apalit
1	10.96	4.37	10.92
2	10.95	4.26	10.98
3	10.94	4.35	10.97
4	10.98	4.31	10.96
5	10.98	4.27	10.96
6	10.97	4.23	10.92
7	10.93	4.23	10.94
8	10.93	4.28	10.95
9	10.97	4.24	10.91
10	10.97	4.20	10.95
11	10.93	4.14	10.93
12	10.85	4.10	10.89
13	10.89	4.16	10.89
14	10.85	4.26	10.97
15	11.01	4.33	10.97
16	11.03	4.35	11.04
17	11.06	4.41	11.05
18	11.05	4.41	11.01
19	11.11	4.47	11.01
20	11.64	5.36	12.14
21	13.14	7.91	14.20
22	15.00	8.94	15.24
23	16.55	9.25	15.46
24	16.45	9.48	15.73
25	16.44	9.42	15.67
26	15.33	9.16	15.41
27	15.17	8.91	15.11
28	15.47	8.69	14.88
29	15.53	8.55	14.66
30	15.27	8.40	14.52
31	15.23	8.18	14.52

Table B.2.8 River Gage Reading (6) July 1962

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1962

No.	15		17		38							
Gaging Station	Penaranda R. (U.W.) San Jonef		Penaranda R. Poblacion		Pampanga R. Sta. Cruz							
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21	6	30.80	7	3.94	7	13.20						
			12	3.90	12	13.12						
			17	3.88	17	13.10						
22	6	31.10	7	3.96	7	14.48						
	17	30.80	12	3.92	12	15.32						
			17	3.80	17	15.20						
23	6	30.60	7	3.89	7	16.60						
	17	30.50	12	3.87	12	16.58						
			17	3.86	17	16.46						
24	6	30.50	7	3.85	7	16.66						
	17	30.40	12	3.83	12	16.42						
			17	3.80	17	16.28						
25	6	30.20	7	4.40	7	16.54						
	17	30.10	12	5.30	12	16.46						
			17	5.00	17	16.32						
26	6	30.00	7	4.34	7	15.52						
	17	30.00	12	4.20	12	15.30						
			17	4.10	17	15.18						
27	6	30.00	7	4.70	7	15.20						
			12	4.60	12	15.12						
			17	4.50	17	15.20						
28	6	30.00	7	4.40	7	15.52						
			12	4.30	12	15.48						
			17	4.25	17	15.46						
29	6	30.00	7	4.20	7	15.50						
			12	4.17	12	15.48						
			17	4.10	17	15.30						
30	6	30.00	7	4.00	7	15.40						
	17	30.00	12	3.94	12	15.44						
			17	3.80	17	15.28						
31	6	30.00			7	15.46						
	17	30.00			12	15.00						
					17	15.22						

Table B.2.11 Mean Daily Discharge July 1962

Monthly summary of mean daily discharge (m³/s) at different stations

River System : Pampanga — July 1962

No.	3	8	12	18	27	35	46
Day \ Gaging Station	Pampanga R. Maluan	Pampanga R. Mabale	Pampanga R. San Anton	Pampanga R. San Vicente	Pampanga R. San Agustin	Pampanga R. Pasig.	Angat R. Tomgos
1	3.	17.	20.	19.	31.	115.	3.
2	3.	17.	21.	22.	34.	116.	2.
3	3.	18.	20.	21.	39.	120.	2.
4	5.	18.	18.	15.	37.	108.	2.
5	7.	17.	18.	13.	34.	106.	2.
6	5.	17.	17.	12.	30.	102.	2.
7	10.	17.	23.	11.	26.	104.	2.
8	96.	20.	45.	11.	24.	98.	2.
9	23.	29.	34.	13.	26.	91.	2.
10	30.	65.	50.	19.	47.	99.	2.
11	33.	31.	29.	15.	37.	94.	3.
12	26.	25.	37.	17.	34.	85.	18.
13	36.	43.	44.	18.	36.	89.	22.
14	26.	43.	40.	25.	63.	117.	9.
15	22.	89.	39.	35.	81.	138.	9.
16	23.	44.	38.	20.	66.	132.	10.
17	69.	41.	51.	17.	47.	132.	6.
18	36.	38.	48.	16.	42.	120.	4.
19	85.	56.	66.	23.	62.	138.	25.
20	391.	83.	109.	27.	151.	271.	950.
21	723.	54.	1015.	200.	921.	912.	1638.
22	585.	250.	1623.	859.	1700.	1210.	1510.
23	255.	1114.	1380.	913.	2225.	1275.	758.
24	156.	1265.	750.	860.	2246.	1303.	712.
25	116.	816.	468.	827.	2016.	1269.	560.
26	117.	809.	160.	774.	1847.	1252.	423.
27	116.	249.	259.	685.	1482.	1202.	356.
28	176.	176.	300.	580.	1297.	1156.	311.
29	152.	198.	350.	539.	1263.	1122.	291.
30	96.	188.	398.	520.	1189.	1099.	256.
31	184.	253.	320.	440.	1007.	1027.	218.
1mm							

Table B.2.10 Mean Daily Gage Height Aug. 1962

Monthly summary of mean daily gage height (m) at different stations

River System : Pampanga — Aug. 1962

No.	38	39	40
Day \ Gaging Station	Pampanga Sta. Cruz	Pampanga San Juan	Pampanga Sulipan, Apalit
1	15.70	7.94	14.12
2	15.41	7.89	14.00
3	15.46	7.93	13.92
4	15.35	7.73	13.89
5	14.71	7.72	13.78
6	14.62	7.46	13.67
7	14.13	7.22	13.49
8	13.92	6.89	13.30
9	13.93	6.95	13.38
10	13.87	6.80	13.36
11	13.66	6.56	13.21
12	13.31	6.25	13.03
13	13.17	6.13	12.61
14	12.96	5.95	12.46
15	12.74	5.72	12.32
16	12.78	5.77	12.28
17	12.82	5.79	12.31
18	12.53	5.77	12.28
19	13.02	5.96	12.41
20	13.31	6.31	12.78
21	13.46	6.35	12.76
22	13.50	6.39	12.76
23	13.55	6.40	12.74
24	13.41	6.28	12.70
25	13.26	6.13	12.66
26			
27			
28			
29			
30			
31			

Table B.2.12 Mean Daily Discharge Aug. 1962

Monthly summary of mean daily discharge (m^3/s) at different stations

River System : Pampanga

Aug. 1962

No.	3	8	12	18	27	35	46
Day \ Gage Station	Pampanga R. Pinaluan	Pampanga R. Alitaya	Pampanga R. San Antton	Pampanga R. San Vicente	Pampanga R. San Agustin	Pampanga R. Pasig.	Angat R. Lampas
1	285	289	269	395	908	953	209
2	192	154	350	690	941	960	265
3	252	142	473	626	1001	989	233
4	215	244	410	520	514	939	179
5	171	325	350	450	921	937	159
6	156	341	312	398	785	865	172
7	119	246	260	390	689	801	146
8	106	186	212	382	600	720	136
9	117	160	250	375	555	686	320
10	88	139	286	364	590	699	315
11	83	151	270	340	528	642	186
12	101	148	280	335	454	562	116
13	93	142	214	335	441	585	95
14	91	142	180	315	398	496	88
15	110	142	169	304	365	451	99
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Total							

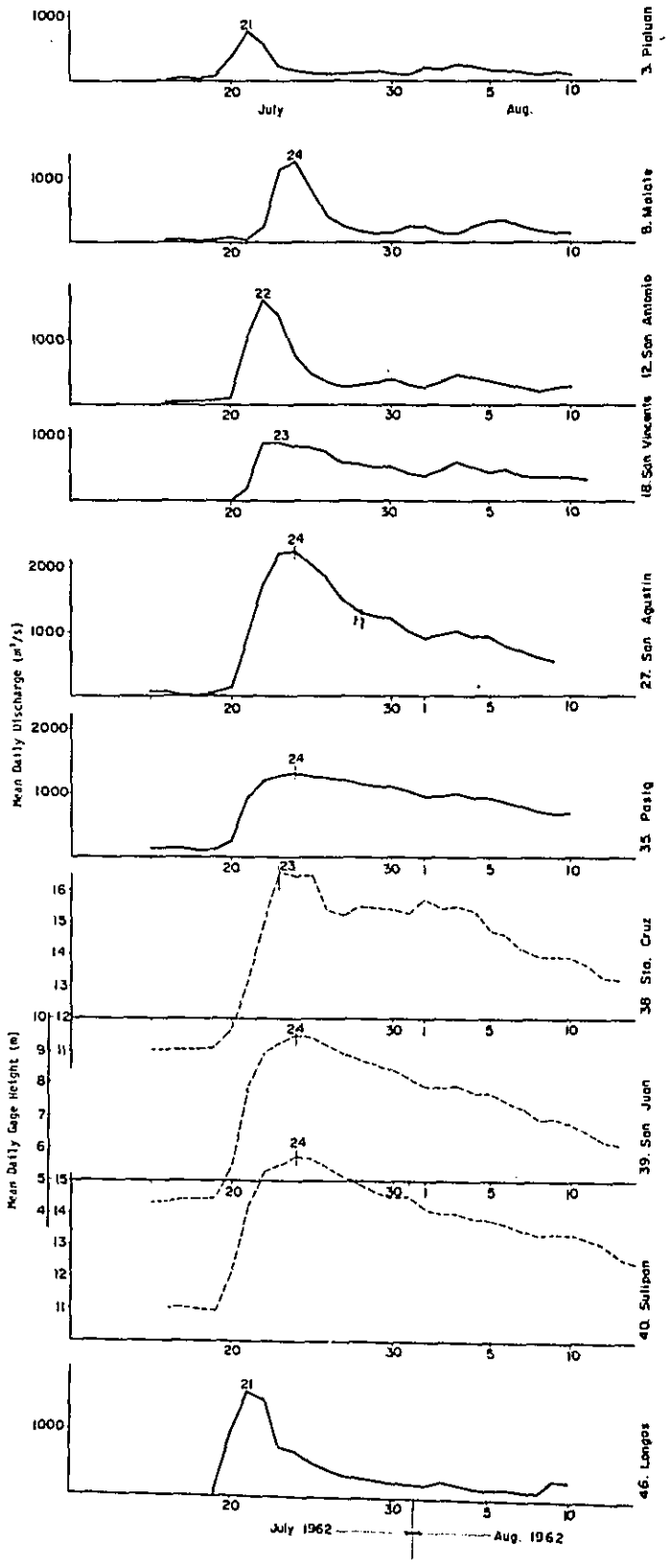

Fig. B.2.7 Mean Daily Gage Height and Discharge July-Aug. 1962

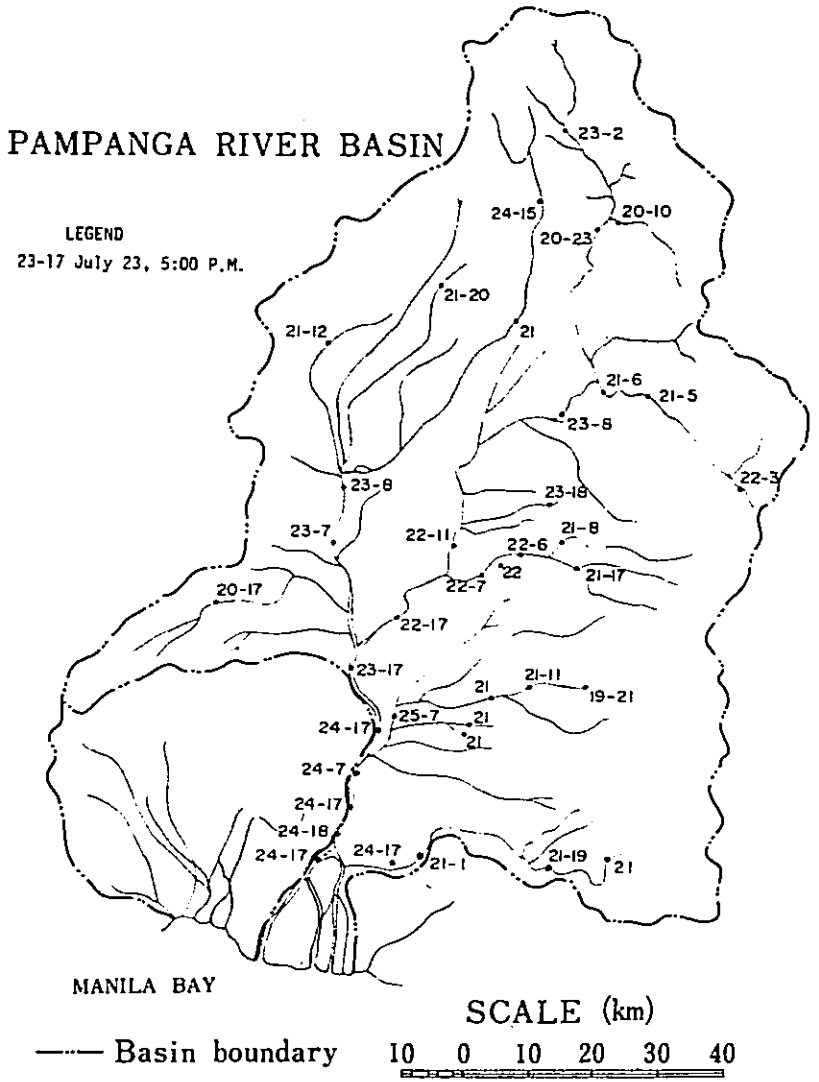

Fig. B.2.8 Date and Time of Peak Gage Height
July 1962

(7) Flood Record, Damages

① Flood Stages

The heavy rains of July 20, 21 and 22 produced the peak flood stage on the Angat river at Plaridal bridge in Pulilan where the water level rose 8.46 meters in a span of 44 hours, starting from elevation 1.73 meter at 6:00 p.m. on July 19 and rising to the peak elevation of 10.19 m. at 1:30 p.m. on July 21. At the Poblacion of Pulilan which is 3.72 km. down stream of Plaridel bridge the water level for the same period rose by 8.06 meters and at Bo. Puñgo, Calumpit which is 2.20 km. upstream of Bagbag bridge the rise in water level was 4.45 meters at which the peak occurred on 12:00 n. of July 22 with an elevation of 5.38 meters.

Two peaks developed at Bagbag bridge. The first peak occurred on 5:00 p.m. of July 22 at elevation 4.62 meter while the second occurred on 9:00 p.m. of July 24 at elevation 4.77 meter. Apparently, the first peak at Bagbag was caused by the flood waters that come from Angat river as vividly shown by the stage hydrographs at upstream gages. While the second peak, which will be shown later, was due to the flood waters that come from the Pampanga river and the Candaba swamp. The secondary peak at Bo. Puñgo, Calumpit which occurred on July 24 was the result of back-water effect from Bagbag. Evidently, during this particular storm the flood peak from Angat river passed through Calumpit two days earlier than the flood peak that came from the Pampanga river and the Candaba swamp.

The San Miguel and Measim rivers which flow directly into the Candaba swamp from the east, recorded their peak stages on July 21, the former with a rise of 5.33 meters in 44 hours and the latter with a rise of 7.05 meters in 19 hours. The peak stage of San Miguel river at San Vicente, San Miguel is elevation 13.75 meters while that of the Measim river at Diliman, San Rafael is elevation 19.80 meters and 8.50 km. downstream at Bahay Pare, Candaba the peak stage was at elevation 8.32 meters.

North of the Candaba swamp, on Pampanga river at San Anton, San Leonardo the water level rose by 5.58 meters from elevation 13.90 meters on 7:00 a.m. of July 20 to peak elevation of 19.48 meters which occurred on 11:00 a.m. of July 22. On the Peñaranda river at Capan the water level rose by 3.02 meters from elevation 15.16 on 5:00 p.m. of July 19 to peak elevation of 18.18 meters on 7:00 a.m. of July 22. Just below the confluence of these two rivers (Pampanga and Peñaranda rivers) at San Isidro, the recorded peak was elevation 16.72 meters which occurred on 3:30 p.m. of July 22.

At San Vicente, Cabiao, the water level reached elevation 9.90 m. on the morning of July 21 at which level the water started flowing into the Cabiao-Candaba floodway. Flow through this floodway lasted till July 28 when the water level in the Pampanga river had receded back to elevation 9.90 meters. The peak stage at this point was elevation 11.70 meters which occurred on 6:00 p.m. of July 22.

North of San Antonio swamp on the Rio Chico river at Sto. Rosario, Zaragosa the water level rose by 6.80 meters starting from elevation 10.91 m. on 5:00 p.m. of July 19 to peak elevation of 17.71 meters which occurred on 5:00 p.m. of July 22. 17 km. downstream from Zaragosa along Rio Chico river at Sta. Monica, Concepcion the water level rose by 4.16 m. starting from elevation 9.16 meters on 5:00 p.m. of July 19 to peak elevation of 13.32 meters which occurred on 7:00 a.m. of July 23.

At San Agustin, Arayat the water stage of the Pampanga river rose by 7.79 meters starting from elevation 2.15 meters on 6:00 p.m. of July 20 to peak elevation of 9.94 meters which occurred on 6:00 p.m. of July 23. Evidently, the peak stage at Arayat occurred upon the arrival of the flood peak from Rio Chico river at San Antonio swamp which came one day later than the flood peak that came from the upper Pampanga river.

At Candaba bridge, the water stage of the Pampanga river rose by 6.22 meters, starting from elevation 0.93 meters on 7:00 a.m. of July 20 to peak elevation of 7.15 meters which occurred on 12:00 n. of July 24.

At San Luis, the water level rose by 5.74 meters, starting from elevation 1.30 meters which occurred on 2:00 p.m. of July 20 to peak elevation of 6.07 meters which occurred on 4:00 p.m. of July 24. It will be noted that the water level at San Luis started to rise earlier than at Candaba. This is so because of the flood waters that came from San Miguel and Measim rivers.

At San Juan, San Simon, the water level rose by 4.95 meters, starting from elevation 0.79 meters on 5:00 p.m. of July 19 to peak elevation of 5.74 meters which occurred on 4:00 p.m. of July 24.

At Bo. Sulipan, Apalit the water level rose by 4.73 meters starting from elevation 0.49 meters on 1:00 a.m. of July 20 to peak elevation of 5.22 meters which occurred on 5:00 p.m. of July 24.

At Sulipan bridge, the peak stage occurred on 5:00 p.m. of July 24 with elevation 4.88 meters and at Calumoit bridge the peak was recorded on 9:00 p.m. of July 24 with elevation 4.83 meters.

Downstream of Calumpit on the Pampanga river at Bo. San Miguel the water level rose by 3.49 meters starting from elevation 0.87 m. on 12:00 of July 20 to peak flood elevation of 4.36 meters which occurred on 7:00 a.m. of July 24.

At the upstream end of Bebe-San Esteban diversion channel the peak flood elevation of 2.46 meters occurred on 12:00 m.n. of July 24 and at the downstream and at the Guaqua river the peak flood elevation of 1.32 meters which occurred on 2:00 p.m. of July 21. It will be noted that the peak flood stage at Guagua river was not the effect of flood waters that came neither from the Pampanga river nor from the other tributaries of the Guagua river. It was more of the effect of tide as the tide level on Manila Bay on 12:15 p.m. of July 21 was at elevation 0.81 meters. During the height of the flood in the Pampanga river system on July 24 the heighest tide level at elevation 0.32 meters which occurred at 2.52 p.m. and on July 25 the heighest tide was at elevation 0.35 m.

On the Pampanga river at Masantol the peak flood elevation of 1.83 meters occurred on 5:30 a.m. of July 25.

On the Hagonoy river at Bo. San Antonio Hagonoy the peak flood elevation was 3.13 meters.

On the Labangan river at Bo. San Antonio, Calumpit which is 2 km. downstream of Bagbag bridge the peak flood elevation of 3.83 meters occurred on 8:00 p.m. of July 24.

The sharp peak that characterized the hydrographs of Pampanga river at San Leonard and Penaranda river at Gapan were not reflected in the hydrograph at Cabiao and Arayat where the graphs are relatively flat and the peak were gradual. Similarly with Angat river at Pulilan where the peak was sharper than the hydrograph at Calumpit. This was to be expected considering the tremendous natural storage capacity of the Candaba and San Antonio swamps. The stage hydrographs for different gaging stations are shown on Fig. B.2.7.

② Calumpit-Plaridel Leves

During the peak stage of Angat river on July 21 and 22 the portion of Calumpit-Plaridel levee from Plaridel to Bo. Dampol (which is 6.5 km. long) held through with no sign of overtopping. On the lower portion, between Bo. Dampol and Bagbag the dike was overtopped at several sections and two gaps had been opened imposed by the erosion of the river bank and the dike section itself. One of the gaps is 110 meters long at Bo. Dampol. The other gap is near Bagbag which is 6 meters long.

On the north bank of Angat river, the Calumpit-Pulilan provincial road including the town of Pulilan except for high portions within the town proper was under water for three days caused by the overflowing of the river.

③ Calumpit Pocket Dyke

Floodwaters entered the town proper of Calumpit through several sections of the Calumpit pocket dike especially at points where it intersects the national highway and the provincial roads and from seepage through damaged culverts.

The portion of the national highway at Calumpit was rendered impassable for five days by motor vehicles except for few diesel trucks mounted on high chasis.

④ Arayat-Cabiao Ring Levee

On July 22, 1962, the area inside the Arayat-Cabiao ring levee southeast of the National road was totally submerged in water. The portion of the ring levee from km. 16-000 up to km. 25-000 have held on quite satisfactorily although it has been continually threatened with heavy scouring on various places, they were instantly repaired. The portion from km. 0-000 to km. 16-000 have practically been rendered vain. Crevasses have developed in the levees that there was no way of stopping the surging water coming from these gaps.

⑤ Cabiao-Candaba Floodway (North Dike)

During the flood of July 1962 the peak flow along Cabiao-Candabe floodway occurred on July 21st midnight when the water was still rising, the portion of the dike at km. 1-089 developed a sub surface leak. The seepage at 4:00 a.m. of the same day have developed into a 1 meter gap. From then on followed a chain of erosion that resulted in the washing out of the dike up to km. 1-142.

In about the same manner the following have also resulted; a break of 12 m. from km. 1-348 to km. 1-360; a break of 9 m. from km. 1-370 to km. 1-379; and break of 10 m. from km. 1-434 to km. 1-444. These catastrophies incidentally have all developed on the same day on July 21, the day before the peak flow.

⑥ Arnedo Dike

Unlike during the flood which occurred in August 1960 the Arnedo dike was not totally overtopped. The high portions on which the flood level was not too high above the top of the dike were successfully prevented from being overtopped by placing sand-bags and wooden plans. On the lower sections, however, where emergency protection have been futile, the dike was overtopped and some portions have even been critically crevassed.

The portion of Arnedo dike from Apalit to San Simon (Km. 0 to Km. 10) have been generally controlled on July 24 when the flood peak paused this section. Impending overflows in some portions were readily remedied with the use of sand bags. However, at Bo. San Jose (Km. 6-500 to Km. 7-440) the dike being inherently low, overtopping occurred on 2:00 a.m. of July 22 but for only a short time as sand bags have been laid out immediately. Sand-bags placed on the 10-meter gap that developed at Km. 6-500 were reinforced with wooden planks. and by 5:00 a.m. on July 23, this portion of the dike has been under control and was never threatened from then on.

The portion of Arnedo dike on the vicinity of San Luis, Pampanga (Km. 10 to Km. 18-400) was overtopped at several sections. Flood water started to overflow through the lower sections on the afternoon of July 23. Attempts have been made to raise the dike with sand bags but human effort was defeated by the rushing flood waters. The protection of this section was therefore abandoned thus inundating the area between the Arnedo dike and the Arayat-Apalit setback lavee bounded by spur dikes at Km. 10 and at Km. 18-400 which includes the town proper of San Luis. This area had been under water for one week which was drained only by gravity when the water on the Pampanga river receded to the level below the natural ground surface.

The portion of Arnedo dike from Km. 18-400 to the Candaba-Sta. Ana national highway embankment was successfully protected from threats of being overtopped.

The portion of the dike from Candaba up to Arayat was completely under water from July 21 to August 5, and thereby rendered useless as far as flood protection was concerned.

⑦ Arayat-Apalit-Masantol Setback Levee

This setback levee despite the failure of Arnedo dike in the vicinities of San Luis, Candaba and Arayat withstood the flood. The three uncomplete gaps at San Simon and Apalit with an aggregate length of 1,590 meters did not aggravate the flooding condition on the agricultural plains of San Fernando as what happened during the flood of August 1960 because the portion of the Arnedo dike within this area have been successfully protected. The most critical section of this dike where signs of seepage were already apparent on July 21 was the new fuse dike near Candaba. This was remedied immediately, however, and was never threatened from then on.

Flood of May 1966

(1)	Weather Record		
(2)	Typhoon Track	Fig. B.3.1	(P. 92)
(3)	Rainfall		
	(i) Rainfall Station	Table A.4.4	(P. 13)
		Fig. A.4.1	(P. 16)
	(ii) Hourly Rainfall	Table B.3.2-5	(P. 93)
		Fig.	(P.)
	(iii) Daily Rainfall	Table B.3.6	(P. 95)
	(Isohyetal Map)	Fig. B.3.2-8	(P. 96)
	(iv) Basin Daily Rainfall	Table B.3.7	(P. 99)
(4)	Gage Height		
	(i) Stream Gaging Station	Table A.4.6	(P. 17)
		Fig. A.4.3	(P. 19)
	(ii) River Gage Reading	Table B.3.8-19	(P.100)
	(iii) Hourly Gage Height	Table	(P.)
		Fig.	(P.)
	(iv) Mean Daily Gage Height	Table B.3.20-21	(P.106)
		Fig. B.3.9	(P.108)
(5)	Discharge		
	(i) Stream Gaging Station	Table A.4.6	(P. 17)
		Fig. A.4.3	(P. 19)
	(ii) Mean Daily Discharge	Table B.3.22-23	(P.107)
		Fig. B.3.9	(P.108)
(6)	Peak Time		
	(i) Peak Date and Time (Areal Distribution)		
	(a) Date and Time of Peak Gage Height	Table A.5.3	(P. 28)
		Fig. B.3.10	(P.109)
	(ii) Time Difference between Two Peaks		
	(a) Date and Time of Peak Hourly Rainfall, and that of Corresponding Peak Hourly Gage Height	Fig. B.3.11	(P.109)
	(b) Date of Peak Daily Rainfall, and Date and Time of Corresponding of Peak Hourly Gage Height	Fig.	(P.)
	(c) Date of Peak Daily Rainfall and Corresponding Peak Daily Gage Height	Fig. B.3.12	(P.110)
	(d) Hourly Gage Height Hydrograph with Hourly Rainfall at Sulipan, Apalit	Fig.	( )
(7)	Flood Record, Damages	Fig.	( )
(8)	Flood Forecasting	Fig.	( )

(1) Weather Record

① TROPICAL DEPRESSION BISING (MAY 4 - 8, 1966)

Cyclone Bising reached only the depression stage but however, caused considerable rains and thunderstorms over the northwestern part of Luzon, Batanes, Zambales and Mindro. It originated from a broad low pressure over the South China Sea on the 2nd generally moving east-northeast with an average speed of 20 kph on the 4th. It reached a maximum surface winds of 45 kph from the country gaining extra-tropical characteristics southwest of Okinawa on the 7th.

② TYPHOON KLARING (MAY 11 - 22, 1966)

Typhoon Klaring had its origin in the Caroline Island between Yap and Koror from a moderately active easterly wave with an incipient low along the equatorial through on the 11th of May. It entered in the Philippine Area of Responsibility through 8.8°N moving west northwest at 19 kph with storm intensity of 95 kph winds near the center on the 12th. Klaring intensified into a typhoon on the same day, weakened into a storm and later regained typhoon intensity with maximum sea level pressure of 976 mbs. moving northwesterly at 20 kph. It further increased to a maximum winds of 155 kph on the 13th. It hit Samar on the next day. Klaring traversed the west coast of Samar, passed between Catbalogan and Tacloban, then skirted to the South of Masbate in a more westerly direction and slowed down to about 11 kph to store energy for intensification. It reached its highest intensity as it passed 20 kms west of Romblon with maximum wind of 220 kph and minimum sea level pressure of 970 mbs. At the same time, there was a sub-tropical anticyclone persistent ridge moving very slowly to the east over the archipelago. As Klaring swept over the mountain terrain of Mindro, it weakened cosiderably splitting its eye. At about this time, a secondary circulation was developing 130 kms northwest of Ilocos Norte. The main circulation after it had crossed the northern tip of Pangasinan at 8 PM same day weakened into a tropical storm and gradually filled up over the mountain areas of La Union in the morning of the 20th. The secondary circulation had moved oppositely to the southwest intensifying to a storm while the main circulation filled up as it moved northeast. Klaring passed closed to the north of Basco until later on absorbed by extra-tropical cyclone at south of Japan on the 22nd. The maximum 24 hour rainfall recorded was 315.5 mm.

③ TYPHOON DELING (MAY 25 - 29, 1966)

Deling was one of the few cyclones formed over the south China Sea. It came closet to the land when it was 140 kms west of Iba, Zambales. The intensification of the Southwest monsoon and ITCZ effects gave considerable rains ever the western coast of Northern Luzon.

It developed as a broad low pressure area along the equatorial trough over South China Sea while Klaring was 670 kms east northeast of Basco on May 22. It became a definite circulation on the 23rd until it intensified into a depression with 55 kph maximum winds on the 25th estimated 400 kms west of Manila. On the 26th, it became a storm with 82 kph maximum winds near the center and remained almost stationary for sometime to store energy for intensification. It considerably moved faster to the north-northeast at 12 kph then veered to the northeast as it gained intensity on the 28th. It recurved to the northwest and in the mid-morning of 29th it degenerated into a storm. On the evening of the 30th, it gradually filled up as it crossed Formosa. The maximum wind recorded was 155 kph with minimum sea level pressure of 970 mbs at 281200 Z.

Table B.3.1 Estimated Pressure Values at the Center of Typhoon May 1966

May 1966	Klaring (IRMA)
15 00 00 Z	T 978 mbs
12 00	T 974
16 00 00	T 980
12 00	T 984
17 00 00	T 972
12 00	T 980
18 00 00	T 990
06 00	TS 988
12 00	T 985
18 00	T 970
19 00 00	T 980
06 00	T 980
12 00	TS 985
18 00	TS 985
20 00 00	TS 990
12 00	TS 994

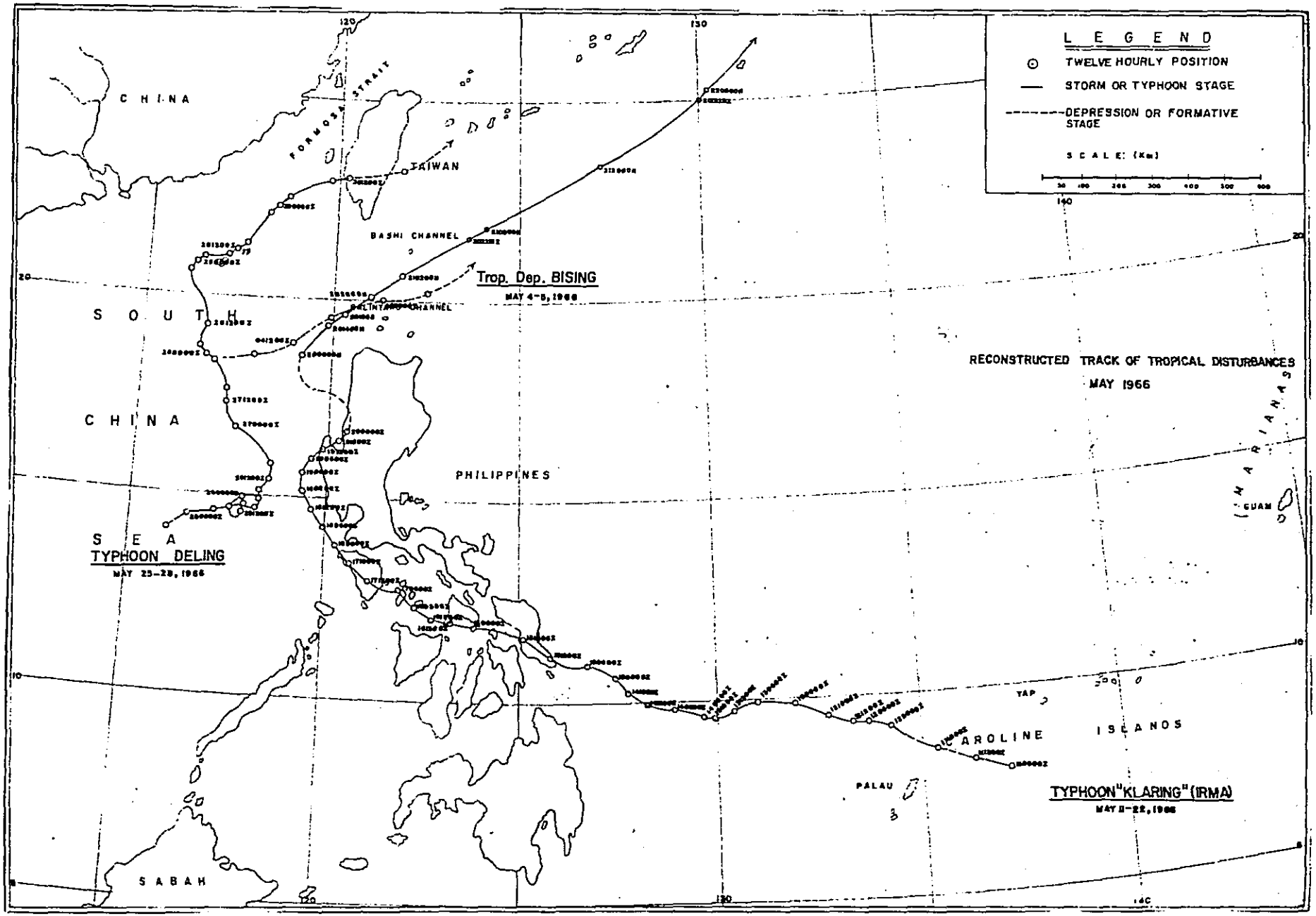

Fig. B.3.1 Typhoon Track May 1966

Table B.3.3 Hourly Rainfall May 19, 1966

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga May 19 1966

No.	34	31	35	
Time \ Gageg Station	Gabaldon	Cabanatuan	Gapan	Arayat
0 – 1	.	1.0	0.5	0.5
2	2.0	.	0.5	1.0
3	10.9	1.0	0.5	2.5
4	6.1	2.0	2.3	7.5
5	10.9	2.0	2.0	3.0
6	3.3	.	0.8	3.0
7	0.5	2.3	1.8	1.5
8	2.0	6.8	4.6	6.4
9	1.0	8.4	5.8	4.8
10	0.5	2.3	1.0	4.8
11	2.3	5.8	4.3	4.6
12	2.0	10.4	5.8	4.6
13	2.3	6.9	4.1	15.0
14	4.8	16.2	5.8	16.5
15	3.1	7.6	2.8	13.5
16	2.0	5.6	3.3	7.4
17	2.3	9.4	3.3	10.7
18	1.5	5.6	2.8	6.6
19	1.5	5.6	3.8	5.8
20	2.3	4.1	2.8	6.6
21	3.1	12.2	3.8	11.2
22	4.6	15.2	15.5	22.1
23	8.9	17.5	13.0	39.5
23 – 24	6.9	28.9	7.6	11.7
Total	.	.	.	.
(0–0	.	.	.	.

Table B.3.2 Hourly Rainfall May 18, 1966

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga May 18 1966

No.	34	31	35	
Time \ Gageg Station	Gabaldon	Cabanatuan	Gapan	Arayat
0 – 1	.	.	.	.
2	.	.	.	.
3	.	.	.	.
4	.	.	.	.
5	.	.	.	.
6	.	.	.	.
7	.	.	.	.
8	.	.	.	.
9	2.3	.	.	2.
10	.	.	.	3.5
11	2.	0.5	7.4	0.5
12	22.7	5.1	0.5	.
13	0.5	1.3	0.8	1.
14	.	.	.	1.5
15	1.5	.	0.5	1.
16	2.3	.	0.5	2.
17	2.	4.1	0.8	2.
18	4.3	1.	0.8	1.
19	10.2	1.	0.8	3.
20	2.	0.5	1.3	2.
21	4.1	1.8	2.3	4.
22	2.	0.8	0.5	2.5
23	1.	0.3	0.5	8.5
23 – 24	1.5	0.5	0.5	2.
Total	.	.	.	.
(0–0	.	.	.	.

Table B.3.5 Hourly Rainfall May 21, 1966

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga May 21 1966

No.	34	31	35										
Time \ Gaging Station	Gabaldon	Cabanatuan	Gapan	Arayat									
0 – 1	6.1	22.9	14.2	8.1									
2	5.1	7.6	15.2	8.1									
3	1.0	0.5	2.0	4.3									
4	.	0.5	0.5	1.8									
5	.	.	.	.									
6	.	.	.	.									
7	.	.	.	.									
8	.	.	.	.									
9	.	.	.	.									
10	.	.	.	.									
11	.	.	.	.									
12	.	.	.	.									
13	.	.	.	.									
14	.	.	.	.									
15	.	.	.	.									
16	.	.	.	.									
17	.	.	.	.									
18	.	.	.	.									
19	.	.	.	.									
20	.	.	.	.									
21	.	.	.	.									
22	.	.	.	.									
23	.	.	.	.									
23 – 24	.	.	.	.									
Total	.	.	.	.									
0 – 0	.	.	.	.									

Table B.3.4 Hourly Rainfall May 20, 1966

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga May 20 1966

No.	34	31	35										
Time \ Gaging Station	Gabaldon	Cabanatuan	Gapan	Arayat									
0 – 1	9.4	6.9	7.6	11.2									
2	11.2	3.6	7.6	15.0									
3	21.5	1.0	8.9	31.0									
4	9.4	3.6	16.3	7.4									
5	8.9	2.8	2.0	1.0									
6	2.0	4.6	8.6	5.6									
7	13.5	10.4	8.6	11.7									
8	7.0	5.8	7.1	8.1									
9	6.1	7.6	10.4	25.2									
10	4.6	1.8	6.1	31.0									
11	1.8	1.8	6.1	16.8									
12	3.1	1.5	7.4	12.7									
13	21.1	0.5	3.1	1.5									
14	13.5	8.4	3.1	5.3									
15	9.4	1.8	6.1	12.9									
16	10.2	1.5	2.5	1.8									
17	3.1	1.8	.	8.1									
18	3.1	4.3	3.1	1.8									
19	6.9	1.5	2.0	4.8									
20	6.1	5.3	2.0	3.3									
21	1.0	3.3	1.0	2.5									
22	0.5	0.5	1.0	1.8									
23	.	1.0	7.9	5.8									
23 – 24	1.0	11.9	10.4	13.0									
Total	.	.	.	.									
0 – 0	.	.	.	.									

Table B.3.6 Daily Rainfall May 1966

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga

May 19 66

No.	4	5	7	11	31	33	34	35
Day \ Gage Station	Santor RGS Cuyapo	Santor RGS San Vicente	Lumbny	Angat RIS Ruston	Cabanatuan	Arayat	Cabaldon	Gapan
1	10.4	.	.	.	.	.	10.4	.
2	10.1	.	.	.	.	.	.	.
3	2.7	.	.	.	.	.	10.2	.
4	.	.	.	5.5	31.5	.	2.8	2.0
5	.	.	.	.	.	.	.	.
6	40.3	.	.	.	1.3	.	40.1	25.9
7	1.5	.	26.6	.	27.9	.	1.5	2.3
8	9.6	.	53.3	2.0	1.3	.	9.6	2.0
9	4.0	18.2	3.8	96.7	26.7	13.0	4.1	.
10	26.4	14.7	40.6	35.5	25.1	46.0	26.4	43.1
11	41.9	.	.	.	27.9	.	41.9	3.1
12	0.5	.	10.1	.	10.2	.	0.5	19.3
13	.	11.1	.	20.8	.	.	.	1.5
14	.	10.1	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.
16	6.0	.	.	5.5	2.8	.	6.1	0.5
17	98.2	.	.	14.2	3.6	7.9	98.3	18.1
18	99.0	.	2.5	44.7	31.0	56.1	99.1	30.2
19	81.7	138.8	27.9	183.1	197.4	266.4	132.0	152.2
20	103.6	113.2	12.7	108.4	105.9	170.4	103.7	104.1
21	23.1	84.0	78.7	2.0	0.5	22.9	23.1	31.0
22	22.6	76.2	180.3	25.9	.	4.8	22.6	10.4
23	136.8	44.0	60.9	5.3	29.0	16.0	134.9	35.5
24	3.0	11.1	.	0.5	.	.	3.1	.
25	34.5	9.3	7.6	17.7	8.6	23.1	34.5	12.9
26	80.0	10.6	17.0	50.5	31.3	62.8	80.1	35.0
27	35.0	11.6	5.0	4.5	19.0	14.5	35.1	16.0
28	10.4	.	.	.	.	.	10.4	.
29	11.6	9.1	.	.	.	.	11.7	.
30	.	10.6	3.0	.	3.3	14.2	.	18.8
31	.	.	19.0	1.7	2.5	2.0	0.3	1.5
Tot.	890.9	586.6	549.0	574.5	586.8	720.1	942.5	565.4

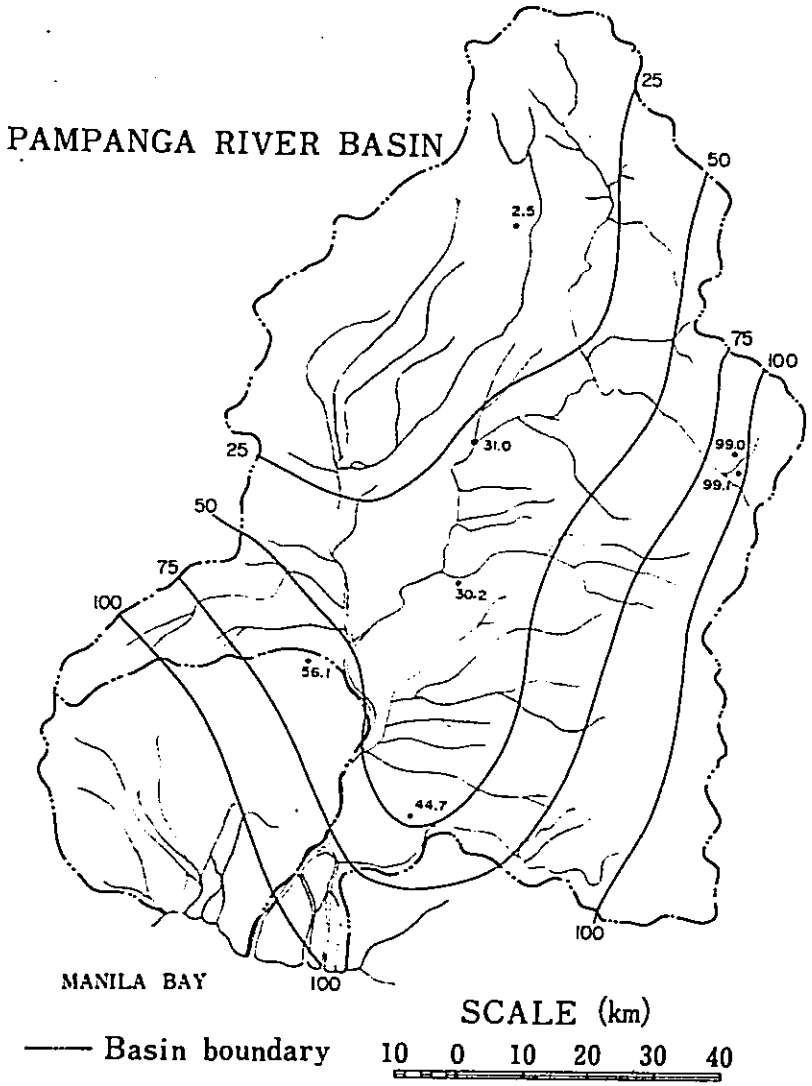

Fig. B.3.3 Isohyetal Map May 18, 1966

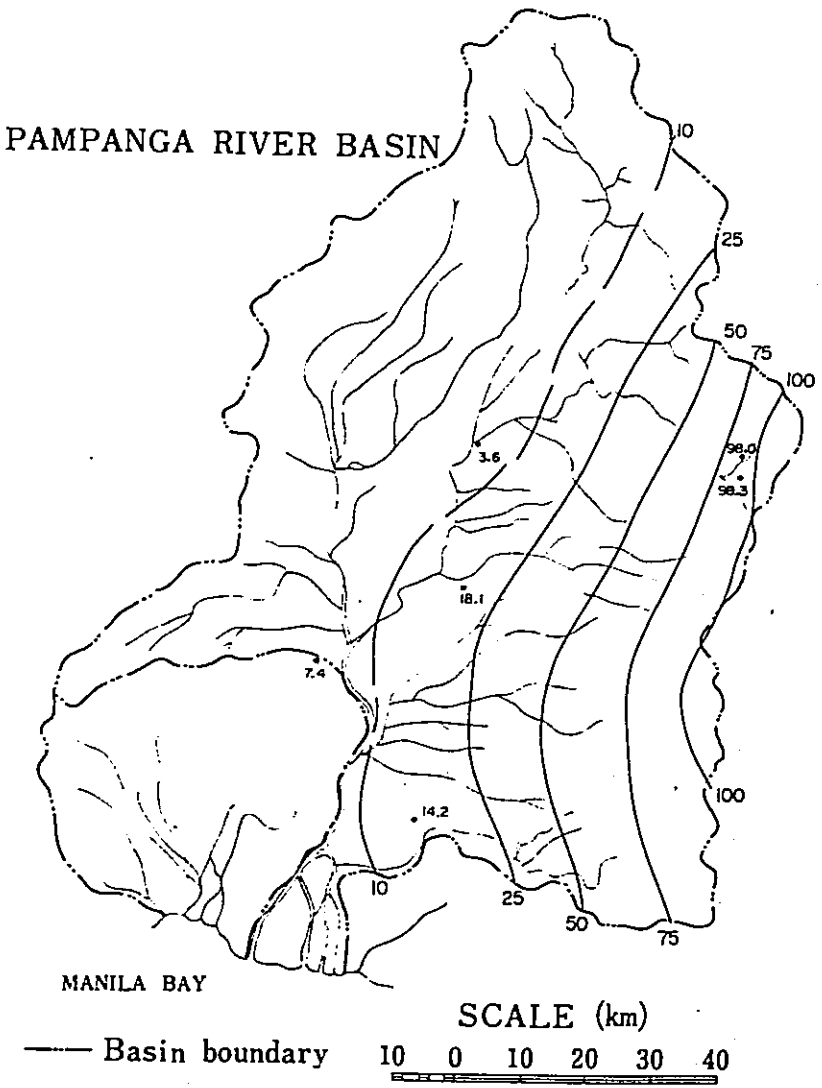

Fig. B.3.2 Isohyetal Map May 17, 1966

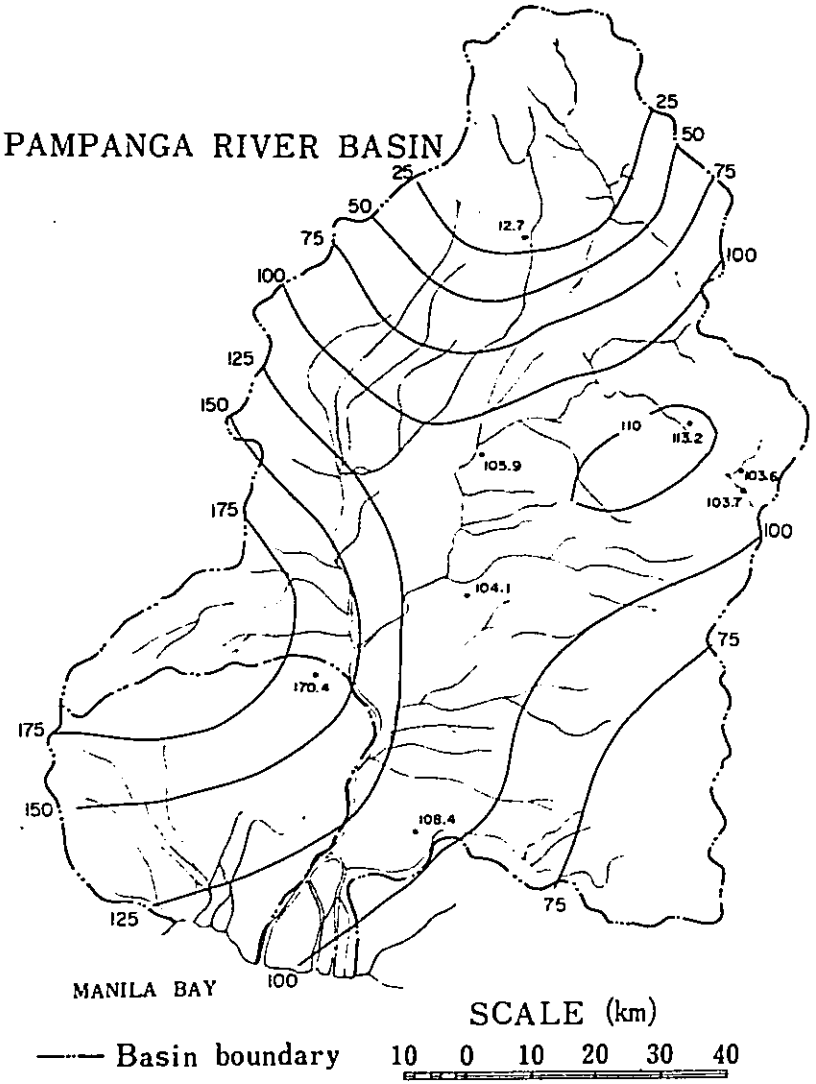

Fig. B.3.5 Isohyetal Map May 20, 1966

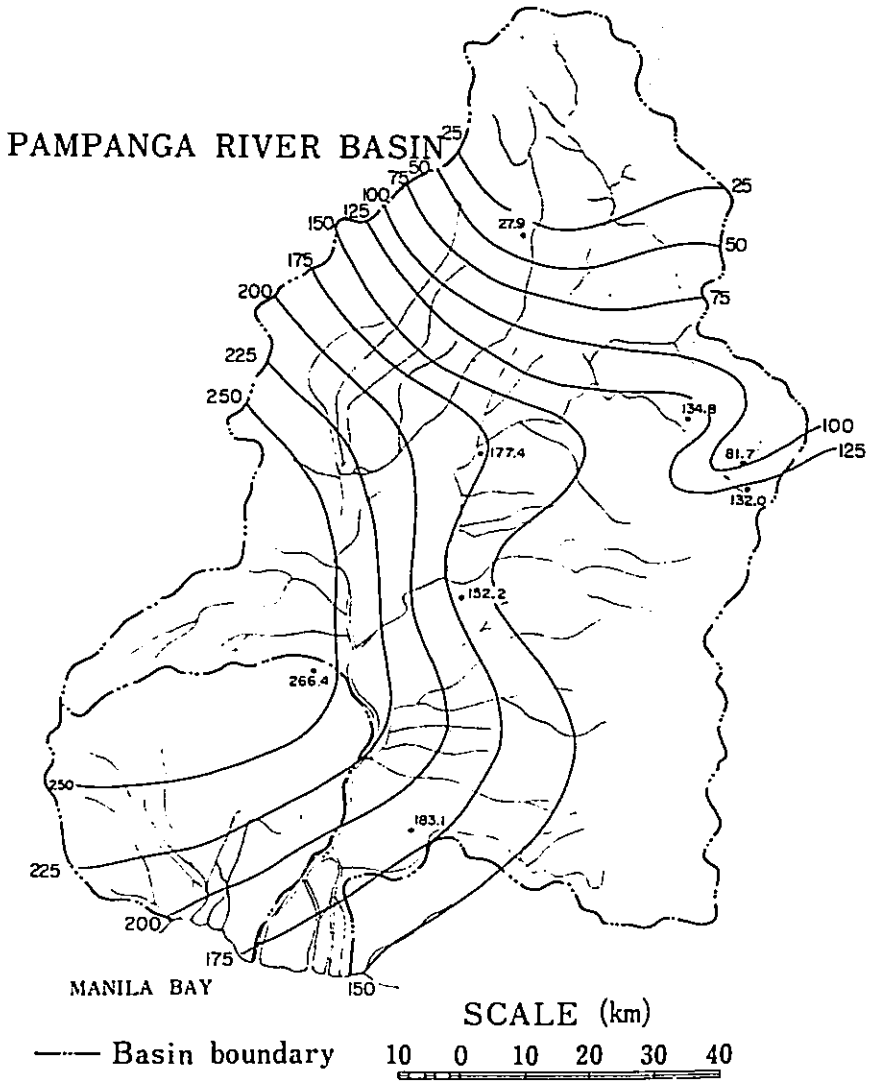

Fig. B.3.4 Isohyetal Map May 19, 1966

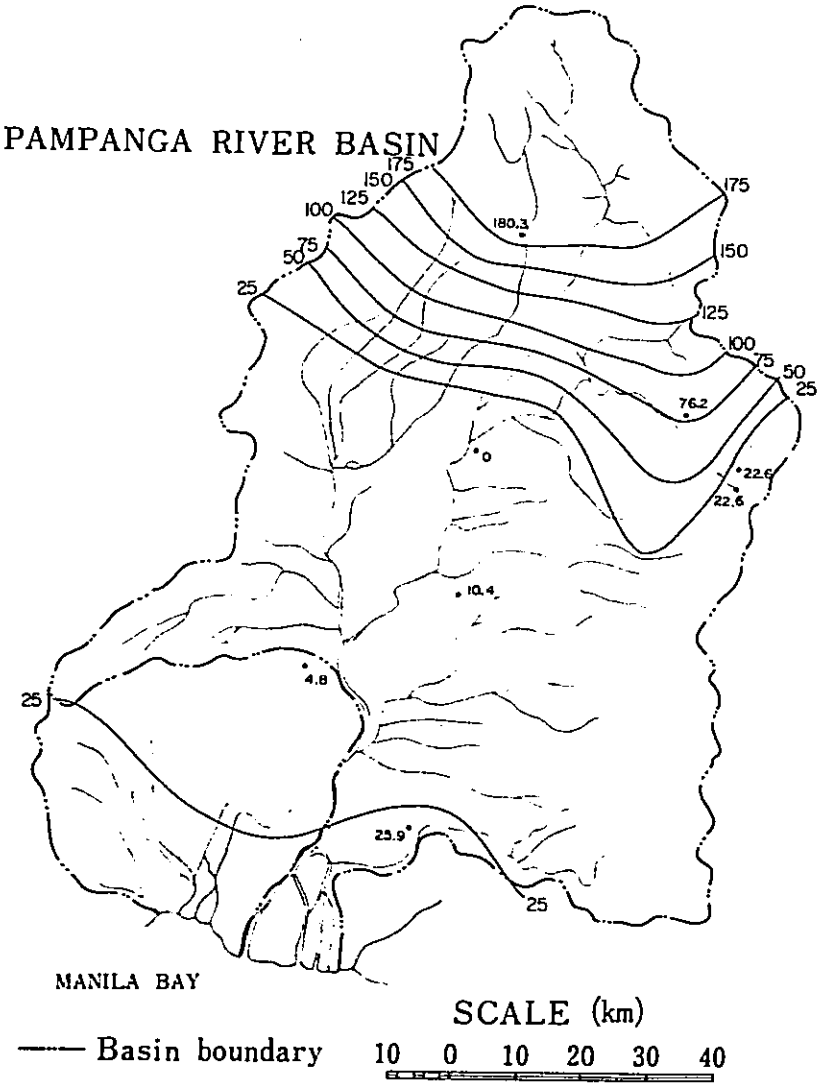

Fig. B.3.7 Isohyetal Map May 22, 1966

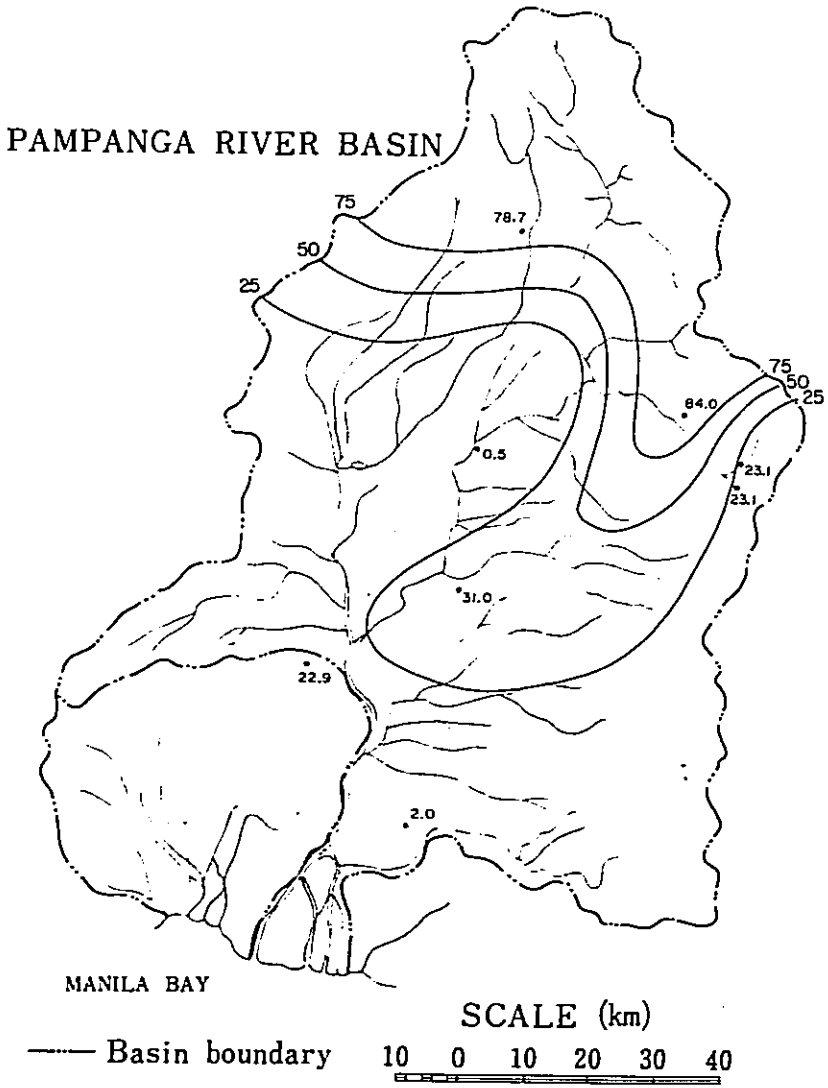

Fig. B.3.6 Isohyetal Map May 21, 1966

Table B.3.7 Basin Daily Rainfall May 1966

Monthly summary of basin daily rainfall (mm)

River System : Pampanga May 1966

Day / Gage Station	Arithmetic Mean (R)
1	2.6
2	1.3
3	1.6
4	5.2
5	0.
6	13.5
7	7.5
8	9.7
9	14.3
10	32.2
11	14.4
12	5.1
13	4.2
14	1.3
15	0.
16	1.9
17	30.0
18	45.3
19	146.9
20	102.8
21	33.2
22	42.9
23	60.1
24	2.2
25	18.5
26	45.9
27	17.6
28	2.6
29	4.1
30	6.2
31	3.4
Total	676.5

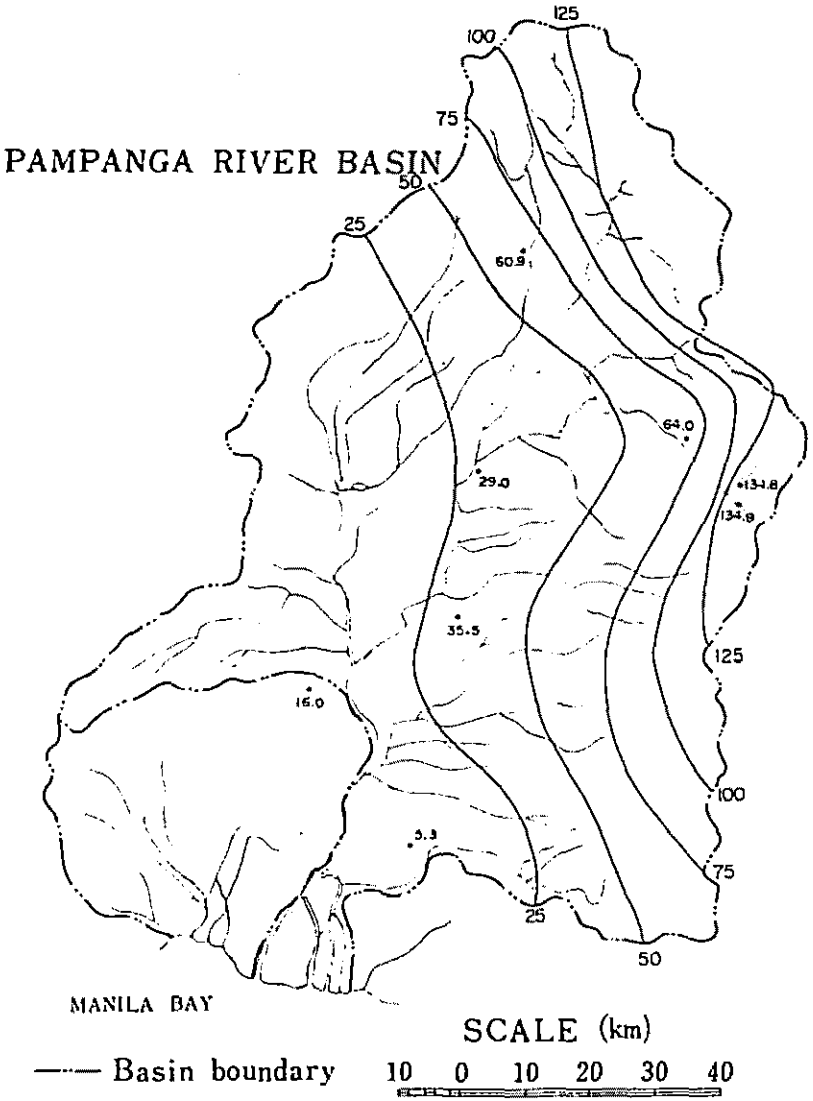

Fig. B.3.8 Isohyetal Map May 23, 1966

Table B.3.9 River Gage Reading (2) May 1966

10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	1		3		4		5		6		7		8	
Gaging Station	Carranglan R.	Baluarte	Pampanga R.	Pitaluan	Digmala R.	Labi	Santor R.	Cuyapa	Santor R.	San Vicente	Coronel R.	Bangkerohan	Pampanga R.	Malate
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	6	1.10	6	1.28	7	3.13	7	0.94	6	1.39	6	0.79	6	0.73
			17	1.28							17	0.79		
12	6	1.00	6	1.40							6	0.79		
			17	1.32							17	0.78		
13	6	1.22	6	1.27	7	3.12	7	0.96	6	1.38	6	0.78	6	0.74
			17	1.27							17	0.78		
14	6	1.20	6	1.25							6	0.78		
			17	1.23							17	0.78		
15	6	1.20	6	1.23							6	0.78		
			17	1.23							17	0.78		
16	6	1.18	6	1.27	7	3.13	7	1.00	6	1.41	6	0.77	6	0.73
			17	1.27							17	0.77		
17	6	1.17	6	1.20							6	1.10		
			17	1.22							17	1.16		
18	6	1.27	6	1.64	7	3.41	7	1.34	6	1.46	6	2.34	6	0.73
			17	1.59							17	2.37		
19	6	1.29	6	1.60							6	2.40		
			17	4.30							17	2.47		
20	6	2.60	6	2.70	7	4.15	7	2.70	6	1.52	6	5.55	6	3.65
			17	5.12							17	4.58		

Table B.3.8 River Gage Reading (1) May 1966

10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	1		3		4		5		6		7		8	
Gaging Station	Carranglan R.	Baluarte	Pampanga R.	Pitaluan	Digmala R.	Labi	Santor R.	Cuyapa	Santor R.	San Vicente	Coronel R.	Bangkerohan	Pampanga R.	Malate
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	6	0.95	6	1.12							6	0.80		
			17	1.12							17	0.80		
2	6	0.95	6	1.12	7	3.11	7	0.94	6	1.34	6	0.80	6	0.73
			17	1.12							17	0.80		
3	6	0.94	6	1.12							6	0.80		
			17	1.12							17	0.80		
4	6	0.94	6	1.12	7	3.11	7	0.94	6	1.36	6	0.80	6	0.73
			17	1.12							17	0.80		
5	6	0.96	6	1.12							6	0.80		
			17	1.12							17	0.80		
6	6	0.94	6	1.11	7	3.11	7	0.92	6	1.38	6	0.80	6	0.73
			17	1.11							17	0.79		
7	6	0.94	6	1.11							6	0.79		
			17	1.11							17	0.79		
8	6	0.92	6	1.12							6	0.79		
			17	1.12							17	0.79		
9	6	1.12	6	1.14	7	3.11	7	0.94	6	1.36	6	0.79	6	0.73
			17	2.04							17	0.79		
10	6	1.10	6	1.29							6	0.79		
			17	1.28							17	0.79		

Table B.3.11 River Gage Reading (4) May 1966

10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	9		10		11		12		13		14		15	
Gaging Station	Cabu R.	Cabu	Pampanga R.	Valdefuente	Tabuating R.	Soledad	Pampanga R.	San Anton	Chico R.	Ilog na Munti	Sumacbao R.	Plan	Penaranda R. (U.S.)	San Josef
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1			17	1.58	7	0.60			8	1.36	8	0.67	6	28.80
					17	0.90			17	1.36	17	0.67	17	28.80
2					7	0.70	7	1.98	8	1.39	8	0.65	6	28.80
					17	0.56			17	1.40	17	0.65	17	28.80
3					7	1.00			8	1.40	8	0.65	6	28.80
					17	1.70			17	1.40	17	0.64	17	28.80
4			17	1.60	7	1.05	7	2.00	8	1.50	8	0.63	6	28.80
					17	0.80			17	1.51	17	0.63	17	28.80
5					7	0.65			8	1.52	8	0.63	6	28.90
					17	1.00			17	1.51	17	0.63	17	28.90
6			17	1.65	7	0.96	7	2.03	8	1.52	8	0.84	6	28.90
					17	0.46			17	1.54	17	0.82	17	28.90
7					7	1.00			8	1.52	8	0.89	6	28.90
					17	1.68			17	1.53	17	0.87	17	28.90
8					7	0.92			8	1.54	8	0.83	6	29.00
					17	0.58			17	1.60	17	0.91	17	29.00
9			17	1.80	7	0.80	7	2.00	8	1.58	8	0.90	6	29.50
					17	0.67			17	1.55	17	0.90	17	29.50
10					7	0.57			8	1.56	8	0.89	6	29.30
					17	1.50			17	1.68	17	0.87	17	29.20

Table B.3.10 River Gage Reading (3) May 1966

10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	1		3		4		5		6		7		8	
Gaging Station	Carranglan R.	Baluarte	Pampanga R.	Platuan	Digmala R.	Labi	Santor R.	Cuyapa	Santor R.	San Vicente	Coronel R.	Rangkerohan	Pampanga R.	Halate
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21	6	2.57	6	4.35							6	2.57		
			17	2.90							17	2.54		
22	6	2.50	6	2.41	7	3.83					6	2.49		
			17	2.14							17	2.40		
23	6	2.50	6	2.09			7	2.40	6	1.71	6	2.37	6	2.35
			17	1.99							17	4.18		
24	6	2.48	6	4.40							6	3.82		
			17	2.61							17	3.00		
25	6	2.46	6	2.29	7	3.54	7	1.70	6	2.05	6	2.74	6	2.53
			17	2.08							17	2.35		
26	6	2.40	6	2.01							6	2.27		
			17	2.16							17	2.20		
27	6	2.40	6	2.48	7	3.56	7	1.86	6	1.99	6	3.62	6	2.69
			17	2.34							17	2.78		
28	6	2.39	6	2.56							6	2.43		
			17	2.44							17	2.36		
29	6	2.37	6	2.37							6	2.55		
			17	2.09							17	2.15		
30	6	2.37	6	2.08	7	3.35	7	1.30	6	1.65	6	2.17	6	2.10
			17	1.95							17	2.02		
31	6	2.36	6	2.04							6	1.97		
			17	1.86							17	1.90		

Table B.3.13 River Gage Reading (6) May 1966

10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	9		10		11		12		13		14		15	
Gaging Station	Cabu R.	Cabu	Pampanga R.	Valdefuente	Tabunting R.	Soledad	Pampanga R.	San Anton	Chico R.	Ilog na Hunti	Sumacbao R.	Pias	Penaranda R. (U.Wa.)	San Josef
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21					7	3.30			8	4.00	8	1.98	6	30.60
					17	4.00			17	3.70	17	1.73	17	30.40
22					7	4.63			8	2.42	8	1.50	6	30.40
					17	6.20			17	2.34	17	1.47	17	30.20
23	7	1.30	17	3.44	7	3.00	7	5.05			8	1.60	6	30.40
					17	2.90					17	1.54	17	30.90
24					7	2.20					8	1.49	6	30.80
					17	2.00					17	1.49	17	30.60
25	7	1.12	17	3.60	7	1.80	7	5.83			8	1.45	6	30.40
					17	1.52					17	1.41	17	30.35
26					7	1.30					8	1.56	6	30.20
					17	1.15					17	1.52	17	30.20
27	7	1.00	17	3.62	7	1.00	7	4.45			8	1.49	6	30.40
					17	1.25					17	1.43	17	30.30
28					7	1.38					8	1.43	6	30.20
					17	1.00					17	1.92	17	30.20
29					7	2.00					8	2.45	6	30.20
					17	2.30					12	2.37	17	30.20
											17	2.31		
30	7	0.95	17	3.02	7	2.80	7	4.20			8	2.13	6	30.20
					17	4.00					17	1.91	17	30.25
31					7	2.20					8	1.85	6	30.20
					17	3.00					17	1.82	17	30.20

Table B.3.12 River Gage Reading (5) May 1966

10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	9		10		11		12		13		14		15	
Gaging Station	Cabu R.	Cabu	Pampanga R.	Valdefuente	Tabunting R.	Soledad	Pampanga R.	San Anton	Chico R.	Ilog na Hunti	Sumacbao R.	Pias	Penaranda R. (U.Wa.)	San Josef
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	7	0.47	17	1.92	7	1.00	7	2.10	8	1.66	8	0.85	6	29.50
					17	0.94			17	1.66	17	0.85	17	29.50
12					7	0.75			8	1.68	8	0.84	6	29.40
					17	0.78			17	1.68	17	0.92	17	29.30
13	7	0.48	17	1.72	7	0.80	7	2.30	8	1.66	8	0.82	6	29.20
					17	0.77			17	1.66	17	0.81	17	29.20
14					7	0.76			8	1.59	8	0.79	6	29.20
					17	0.74			17	1.58	17	0.78	17	29.20
15					7	0.70			8	1.57	8	0.77	6	29.10
					17	0.68			17	1.54	17	0.76	17	29.10
16	7	0.37	17	1.62	7	0.66	7	2.12	8	1.50	8	0.76	6	29.10
					17	0.65			17	1.49	17	0.75	17	29.10
17					7	0.63			8	2.47	8	0.74	6	29.10
					17	0.62			17	2.47	17	0.74	17	29.10
18	7	0.35	17	1.60	7	0.60	7	2.07	8	2.42	8	1.23	6	30.40
					17	1.00			17	2.46	17	1.47	17	30.40
19					7	1.30			8	2.43	8	1.58	6	30.50
					17	1.76			17	2.80	17	1.45	17	30.40
20	7	3.00	17	4.43	7	2.00	7	3.78	8	3.90	8	2.44	6	31.20
					17	2.58			17	3.80	17	2.17	17	31.20

Table B.3.14 River Gage Reading (7) May 1966

10-day summary of river-gage reading at different stations

River System : Pampanga — May 1966

No.	16		17		19		20		21		22		27	
Gaging Station	Penaranda R. (RR Br.) San Josef		Penaranda R. Poblacion		Baliwag Catalanacan		Bentituan R. Panong Intake		Talavera R. Lumboy		Talavera Cabuboloonan		Pampanga R. San Agustin	
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	6 26.00		7 3.22						6 0.74		7 1.17		7 4.24	
	17 26.00		12 3.22						16 0.74		17 1.17		17 4.23	
			17 3.22											
2	6 26.00		7 3.22		6 0.32		6 0.78		6 0.74		7 1.17		7 4.23	
	17 26.00		12 3.22				12 0.81		16 0.74		17 1.17		17 4.23	
			17 3.22				17 0.79							
3	6 26.00		7 3.22						6 0.74		7 1.17		7 4.22	
	17 26.00		12 3.22						16 0.74		17 1.17		17 4.23	
			17 3.22											
4	6 26.00		7 3.22		6 0.31		6 0.78		6 0.75		7 1.17		7 4.22	
	17 26.00		12 3.21				12 0.82		16 0.75		17 1.17		17 4.24	
			17 3.21				17 0.80							
5	6 26.00		7 3.20						6 0.74		7 1.17		7 4.32	
	17 26.00		12 3.20						16 0.74		17 1.17		17 4.39	
			17 3.20											
6	6 26.00		7 3.20		6 0.31		6 0.79		6 0.74		7 1.17		7 4.37	
	17 26.00		12 3.20				12 0.82		16 0.74		17 1.17		17 4.35	
			17 3.20				17 0.80							
7	6 26.00		7 3.20						6 0.74		7 1.17		7 4.34	
	17 26.00		12 3.21						16 0.75		17 1.17		17 4.33	
			17 3.21											
8	6 26.00		7 3.21						6 0.76		7 1.17		7 4.32	
	17 26.00		12 3.21						16 0.80		17 1.17		17 4.31	
			17 3.21											
9	6 26.00		7 3.22		6 0.34		6 0.80		6 0.92		7 1.16		7 4.30	
	17 26.00		12 3.22				12 0.85		16 0.82		17 1.18		17 4.30	
			17 3.22				17 0.82							
10	6 26.00		7 3.22						6 0.92		7 1.18		7 4.32	
	17 26.00		12 3.22						16 0.92		17 1.19		17 4.66	
			17 3.22											

Table B.3.15 River Gage Reading (8) May 1966

10-day summary of river-gage reading at different stations

River System : Pampanga — May 1966

No.	16		17		19		20		21		22		27	
Gaging Station	Penaranda R. (RR Br.) San Josef		Penaranda R. Poblacion		Baliwag Catalanacan		Bentitun R. Panong Intake		Talavera R. Lumboy		Talavera Cabnbolonnan		Pampanga R. San Agustin	
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	6 26.00		7 3.22		6 0.38		6 0.82		6 0.83		7 1.20		7 4.56	
	17 26.00		12 3.22				12 0.90		16 0.92		17 1.20		17 4.50	
			17 3.22				17 0.86							
12	6 26.00		7 3.22						6 0.91		7 1.40		7 4.47	
	17 26.00		12 3.22						16 0.90		17 1.30		17 4.46	
			17 3.22											
13	6 26.00		7 3.22		6 0.37		6 0.80		6 0.87		7 1.28		7 4.70	
	17 26.00		12 3.22				12 0.89		16 0.87		17 1.28		17 4.55	
			17 3.22				17 0.85							
14	6 26.00		7 3.22						6 0.86		7 1.28		7 4.58	
	17 26.00		12 3.22						16 0.86		17 1.28		17 4.61	
			17 3.22											
15	6 26.00		7 3.20						6 0.83		7 1.24		7 4.59	
	17 26.00		12 3.20						16 0.83		17 1.24		17 4.58	
			17 3.20											
16	6 26.00		7 3.20		6 0.39		6 0.80		6 0.81		7 1.24		7 4.55	
	17 26.00		12 3.20				12 0.87		16 0.81		17 1.24		17 4.54	
			17 3.20				17 0.85							
17	6 26.00		7 3.20						6 0.81		7 1.22		7 4.54	
	17 26.00		12 3.20						16 0.81		17 1.22		17 4.56	
			17 3.20											
18	6 27.60		7 3.80		6 0.40		6 0.79		6 0.82		7 1.22		7 4.58	
	17 27.55		12 4.05				12 0.83		16 0.82		17 1.22		17 5.02	
			17 4.10				17 0.81							
19	6 27.80		7 4.08						6 1.16		7 1.22		7 6.24	
	17 27.65		12 4.10						16 1.20		17 1.37		17 7.15	
			17 4.20											
20	6 28.10		7 4.80		6 3.03		6 1.66		6 2.40		7 3.47		7 9.16	
	17 28.80		12 4.80				12 1.80		16 4.10		17 4.80		17 10.74	
			17 4.90				17 1.78							

Table B.3.17 River Gage Reading (10) May 1966

10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	40		46											
Gaging Station	Pampanga R.	Sulipan	Angat R.	Longos										
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	7	10.33												
	12	10.83												
	17	11.05												
2	7	10.38	7	11.04										
	12	10.86												
	17	10.80												
3	7	10.56												
	12	10.90												
	17	10.60												
4	7	10.63	7	11.02										
	12	11.10												
	17	10.70												
5	7	10.70												
	12	11.20												
	17	10.88												
6	7	10.78	7	11.07										
	12	11.28												
	17	11.08												
7	7	10.90												
	12	11.35												
	17	11.30												
8	7	10.72												
	12	11.32												
	17	11.29												
9	7	10.62	7	11.09										
	12	11.33												
	17	11.30												
10	7	10.62												
	12	11.22												
	17	11.40												

Table B.3.16 River Gage Reading (9) May 1966

10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	16		17		19		20		21		22		27	
Gaging Station	Penaranda R. (RR Br.)	San Josef	Penaranda R.	Poblacion	Baliuag	Catalanacan	Benituan R.	Panong Intake	Talavera R.	Lombay	Talavera	Cabaholoonan	Pampanga R.	San Agustin
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21	6	28.15	7	4.60			12	7.45	6	2.32	7	2.00	7	11.71
	17	28.02	12	4.50			17	7.42	16	2.31	17	2.00	17	12.28
			17	4.30										
22	6	27.80	7	4.10					6	2.29	7	2.00	7	12.65
	17	27.50	12	4.00					16	2.27	17	1.90	17	12.70
			17	4.00										
23	6	27.56	7	3.98	6	1.21	12	2.30	6	1.42	7	1.89	7	12.66
	17	27.81	12	3.96			17	2.28	16	1.63	17	1.89	17	12.59
			17	3.90										
24	6	27.20	7	4.08					6	1.62	7	1.89	7	12.54
	17	27.18	12	4.02					16	1.63	17	1.89	17	12.52
			17	4.00										
25	6	27.15	7	3.94	6	1.24	6	1.80	6	1.64	7	1.89	7	12.53
	17	27.12	12	3.92			12	2.10	16	1.53	17	1.80	17	12.42
			17	3.92			17	2.06						
26	6	27.10	7	3.90					6	1.52	7	1.80	7	12.08
	17	27.02	12	3.90					16	1.50	17	1.80	17	12.00
			17	3.90										
27	6	27.00	7	3.94	6	1.17	6	1.70	6	1.48	7	1.80	7	11.92
	17	26.98	12	3.92			12	1.96	16	1.89	17	1.80	17	12.08
			17	3.90			17	1.93						
28	6	26.95	7	3.88					6	1.49	7	1.80	7	12.13
	17	26.90	12	3.86					16	1.48	17	1.80	17	12.03
			17	3.80										
29	6	26.89	7	3.80					6	1.47	7	1.80	7	11.84
	17	26.88	12	3.78					16	1.36	17	1.80	17	11.61
			17	3.78										
30	6	26.84	7	3.76	6	1.07	6	1.65	6	1.31	7	1.80	7	11.34
	17	26.85	12	3.76			12	1.80	16	1.29	17	1.80	17	11.08
			17	3.76			17	1.77						
31	6	26.86	7	3.80					6	1.27	7	1.80	7	10.81
	17	26.85	12	3.80					16	1.24	17	1.80	17	10.61
			17	3.78										

Table B.3.19 River Gage Reading (12) May 1966
10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	40		46									
Gaging Station	Pampanga R.	Sulipan	Angat R.	Longos								
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21	7	14.00										
	12	14.08										
	17	14.20										
22	7	14.28										
	12	14.58										
	17	14.68										
23	7	14.68	7	14.13								
	12	14.87										
	17	14.92										
24	7	14.97										
	12	14.96										
	17	14.95										
25	7	14.94	7	14.00								
	12	14.93										
	17	14.92										
26	7	14.90										
	12	14.87										
	17	14.86										
27	7	14.88	7	13.88								
	12	14.83										
	17	14.82										
28	7	14.74										
	12	14.68										
	17	14.64										
29	7	14.58										
	12	14.52										
	17	14.47										
30	7	14.50	7	13.29								
	12	14.32										
	17	14.28										
31	7	14.14										
	12	14.06										
	17	14.00										

Table B.3.18 River Gage Reading (11) May 1966
10-day summary of river-gage reading
at different stations

River System : Pampanga — May 1966

No.	40		46									
Gaging Station	Pampanga R.	Sulipan	Angat R.	Longos								
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	7	10.56	7	11.38								
	12	11.18										
	17	11.38										
12	7	10.52										
	12	11.08										
	17	11.36										
13	7	10.52	7	11.05								
	12	10.98										
	17	11.31										
14	7	10.55										
	12	10.89										
	17	11.26										
15	7	10.56										
	12	10.87										
	17	11.08										
16	7	10.58	7	11.03								
	12	10.84										
	17	10.55										
17	7	10.58										
	12	10.84										
	17	10.55										
18	7	10.62	7	12.00								
	12	10.94										
	17	10.77										
19	7	11.26										
	12	11.83										
	17	11.72										
20	7	12.28	7	12.44								
	12	12.70										
	17	13.28										

Table B.3.21 Mean Daily Gage Height June 1966

Monthly summary of mean daily gage height (m)
at different stations

River System : Pampanga — June 1966

No.	38	39	40
Day \ Gaging Station	Pampanga Sta. Cruz	Pampanga San Juan	Pampanga Sulipan, Apalit
1	14.78	7.70	13.78
2	14.12	7.54	13.52
3	13.87	6.96	13.28
4	13.51	6.46	12.82
5	12.87	5.87	12.31
6	12.53	5.46	12.03
7	12.54	5.45	11.77
8	12.57	5.46	11.58
9	12.21	5.21	11.53
10	11.86	5.00	11.53
11	11.55	4.80	11.46
12	11.53	4.63	11.23
13	11.42	4.51	11.23
14	11.37	4.48	11.20
15	11.41	4.41	11.17
16	11.37	4.51	11.20
17	11.49	4.47	11.39
18	11.52	4.70	11.37
19	11.47	4.42	11.41
20	11.55	4.45	11.45
21	11.32	4.60	11.41
22	11.16	4.55	11.42
23	11.25	4.49	11.42
24	11.47	4.43	11.36
25	11.34	4.32	11.82
26	11.40	4.41	11.40
27	11.50	4.79	11.42
28	11.69	4.71	11.49
29	11.84	4.87	11.59
30	12.06	5.04	11.59
31			

Table B.3.20 Mean Daily Gage Height May 1966

Monthly summary of mean daily gage height (m)
at different stations

River System : Pampanga — May 1966

No.	38	39	40
Day \ Gaging Station	Pampanga Sta. Cruz	Pampanga San Juan	Pampanga Sulipan, Apalit
1	10.58	3.91	10.74
2	10.47	3.81	10.68
3	10.33	3.85	10.69
4	10.41	3.96	10.81
5	10.77	4.07	10.93
6	10.77	4.11	11.05
7	10.70	4.20	11.12
8	10.97	4.25	11.13
9	10.98	4.23	11.08
10	10.92	4.15	11.08
11	10.92	4.21	11.04
12	10.86	4.14	10.99
13	10.94	4.08	10.84
14	10.74	4.01	10.90
15	10.74	3.95	10.82
16	11.01	3.79	10.78
17	10.49	3.77	10.66
18	10.70	3.87	10.78
19	11.40	4.81	11.60
20	13.59	5.78	12.75
21	15.41	8.08	14.09
22	15.92	8.49	14.51
23	16.10	8.82	14.82
24	16.07	8.82	14.96
25	16.42	8.78	14.93
26	15.96	8.71	14.82
27	15.85	8.59	14.84
28	15.84	8.56	14.69
29	15.72	8.46	14.52
30	15.52	8.27	14.37
31	15.45	8.01	14.07

Table B.3.23 Mean Daily Discharge June 1966

Monthly summary of mean daily discharge (m^3/s) at different stations

River System : Pampanga — June 1966

No.	3	8	12	18	27	35	46
Day / Gaging Station	Pampanga R. Mabalacat	Pampanga R. Mabalacat	Pampanga R. San Antonio	Pampanga R. San Vicente	Pampanga R. San Agustin	Pampanga R. Pulg.	Angat R. Bustos
1	51	58	165	409	961	930	133
2	60	44	120	311	719	836	87
3	31	38	90	236	585	750	69
4	28	34	76	211	455	568	48
5	23	31	71	208	316	446	38
6	20	31	67	197	272	311	36
7	35	30	59	191	253	314	19
8	25	26	68	200	273	321	15
9	19	25	61	199	230	276	12
10	16	23	57	179	199	228	10
11	13	24	52	160	170	188	8
12	15	24	52	158	149	151	7
13	15	23	48	159	141	135	6
14	11	21	45	157	133	119	7
15	10	30	41	153	139	111	8
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Tota							

Table B.3.22 Mean Daily Discharge May 1966

Monthly summary of mean daily discharge (m^3/s) at different stations

River System : Pampanga — May 1966

No.	3	8	12	18	27	35	46
Day / Gaging Station	Pampanga R. Mabalacat	Pampanga R. Mabalacat	Pampanga R. San Antonio	Pampanga R. San Vicente	Pampanga R. San Agustin	Pampanga R. Pulg.	Angat R. Bustos
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16	6	8	13	19	16	21	6
17	3	13	11	20	16	21	14
18	25	64	10	22	31	25	61
19	263	394	78	91	229	145	81
20	528	980	1390	320	795	1430	96
21	646	303	696	512	1409	1088	114
22	121	206	570	730	1826	1206	142
23	82	620	826	506	1785	1215	285
24	414	276	708	451	1721	1216	305
25	104	171	858	467	1679	1208	300
26	88	355	700	439	1430	1196	289
27	162	325	341	430	1413	1179	282
28	162	169	440	425	1467	1172	250
29	104	130	330	421	1293	1149	208
30	78	91	327	418	1112	1090	199
31	68	71	280	413	976	1020	178
Tota							

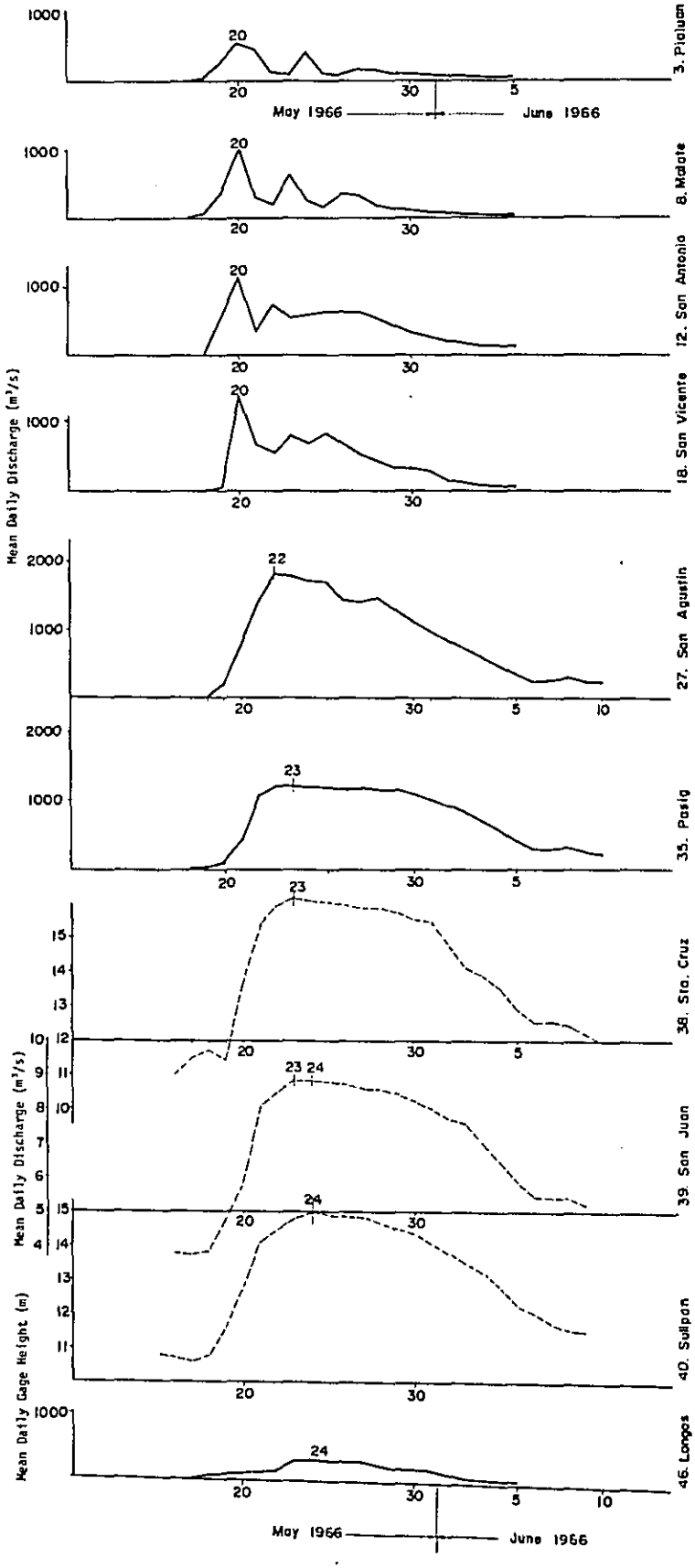

Fig. B.3.9 Mean Daily Gage Height and Discharge May-June 1966

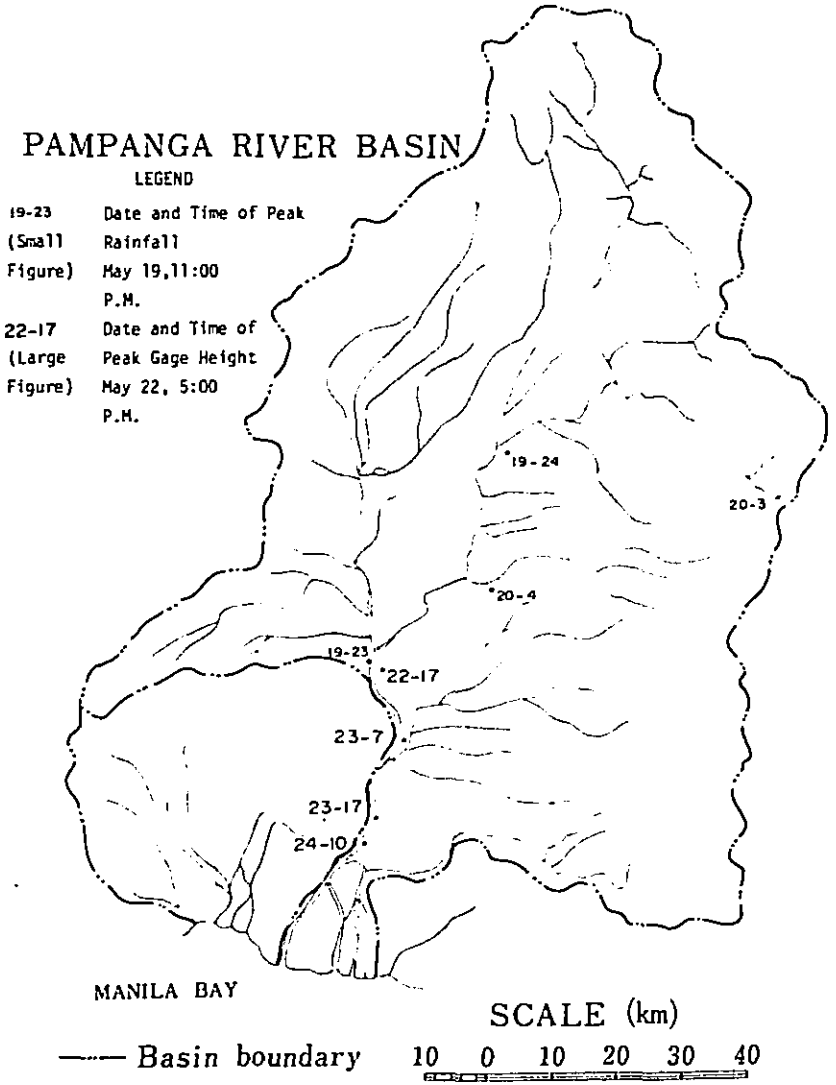

Fig. B.3.11 Date and Time of Peak Hourly Rainfall, and that of corresponding Peak Hourly Gage Height May 1966

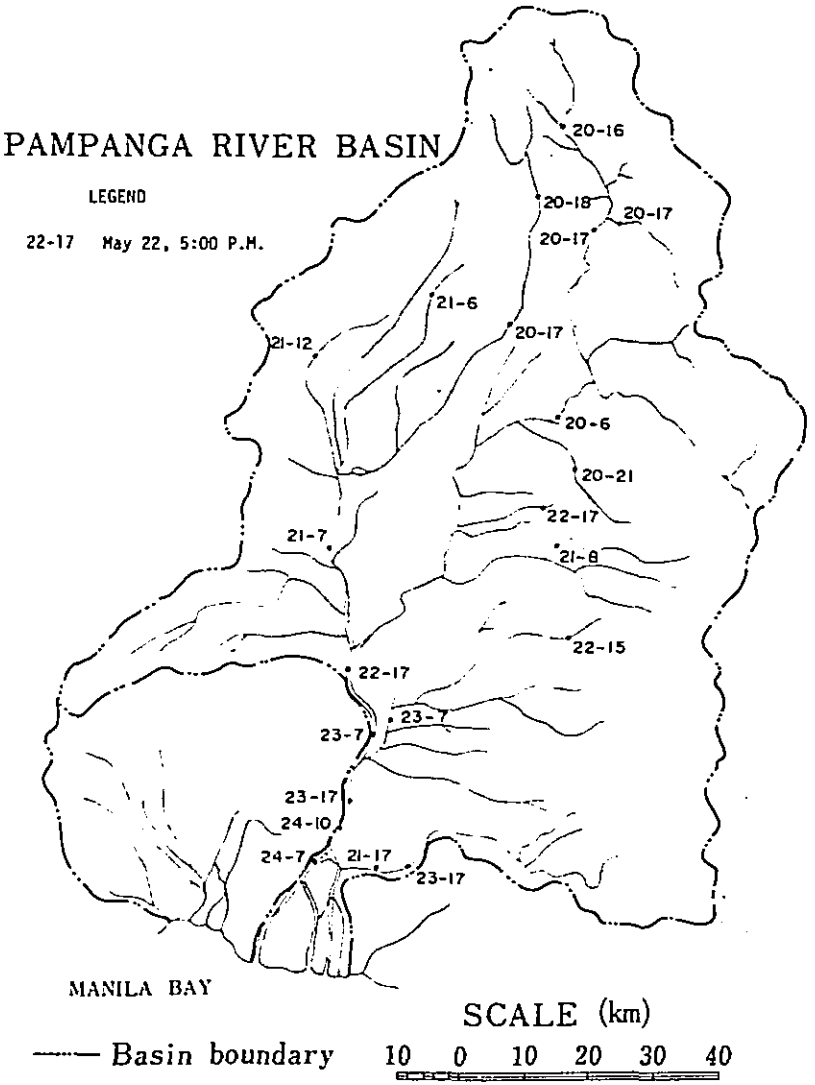

Fig. B.3.10 Date and Time of Peak Gage Height May 1966

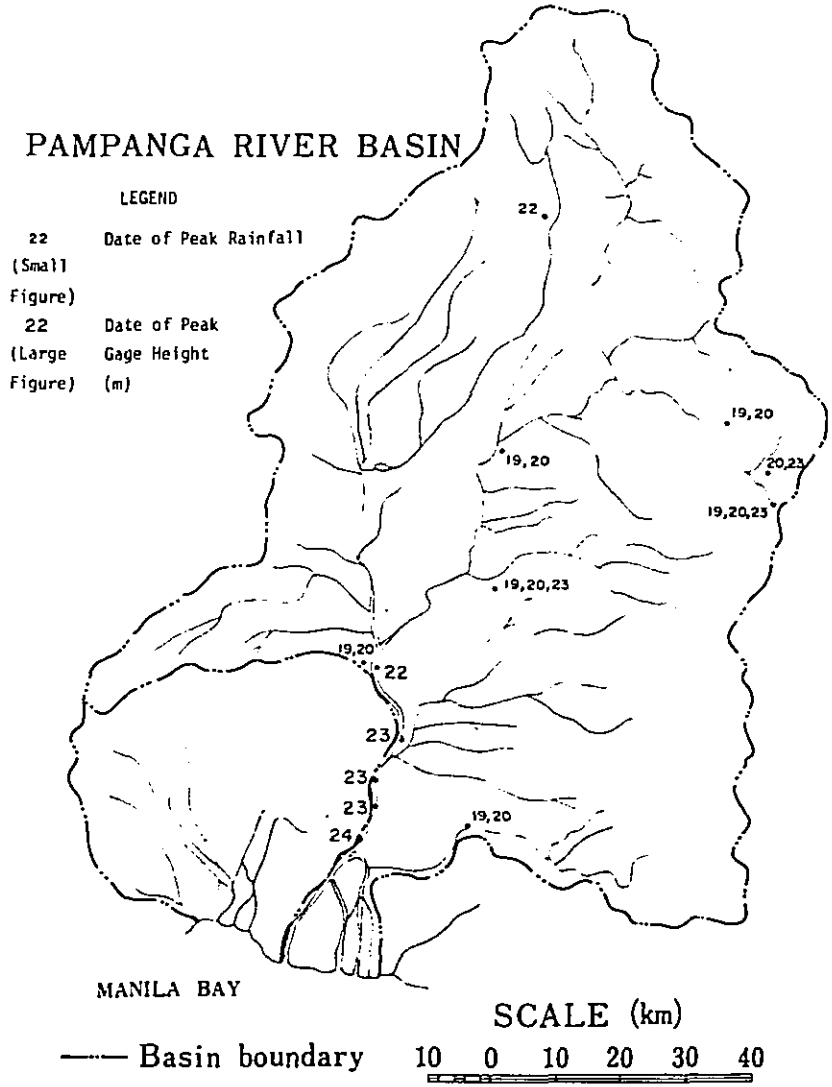

Fig. B.3.12 Date of Peak Daily Rainfall and corresponding Peak Daily Gage Height May 1966

Flood of July 1972

(1)	Weather Record		
(2)	Typhoon Track	Fig. B.4.1	(P.116)
(3)	Rainfall		
	(i) Rainfall Station	Table A.4.5	(P. 14)
		Fig. A.4.2	(P. 16)
	(ii) Hourly Rainfall	Table B.4.1-23	(P.117)
		Fig.	( )
	(iii) Daily Rainfall	Table B.4.24-29	(P.128)
	(Isohyetal Map)	Fig. B.4.2-26	(P.132)
	(iv) Basin Daily Rainfall	Table B.4.30	(P.145)
(4)	Gage Height		
	(i) Stream Gaging Station	Table A.4.6	(P. 17)
		Fig. A.4.3	(P. 19)
	(ii) River Gage Reading	Table B.4.31-54	(P.145)
	(iii) Hourly Gage Height	Table	(P.)
		Fig.	( )
	(iv) Mean Daily Gage Height	Table B.4.55	(P.157)
		Fig.	( )
(5)	Discharge		
	(i) Stream Gaging Station	Table A.4.6	(P. 17)
		Fig. A.4.3	(P. 19)
	(ii) Mean Daily Discharge	Table	( )
		Fig.	( )
(6)	Peak Time		
	(i) Peak Date and Time (Areal Distribution)		
	(a) Date and Time of Peak Gage Height	Table	( )
		Fig.	( )
	(ii) Time Difference between Two Peaks		
	(a) Date and Time of Peak Hourly Rainfall, and that of Corresponding Peak Hourly Gage Height	Table B.4.56	(P.158)
		Fig. B.4.27	(P.159)
	(b) Date of Peak Daily Rainfall, and Date and Time of Corresponding Peak Hourly Gage Height	Fig.	( )
	(c) Date of Peak Daily Rainfall and Corresponding Peak Daily Gage Height	Fig. B.4.28-29	(P.159)
	(d) Hourly Gage Height Hydrograph with Hourly Rainfall at Sulipan, Apalit	Fig. B.4.30-31	(P.161)
(7)	Flood Record, Damages		( )
(8)	Flood Forecasting	Fig. B.4.32	(P.163)

(1) Weather Record

① TROPICAL STORM EDENG (JULY 6 - 8, 1972)

This tropical disturbance started as a broad low pressure area about 500 kms east of Cantanduanes on July 6 before it developed into a depression with maximum winds of 55 kph near the center. It drew nearer the country making its entrance through Casiguran, Quezon in a West Northwest direction at 25 kph. Widespread heavy continuous rains and winds over the Luzon and the Visayas was brought about by the intensification of southwest monsoon on the 7th. As the depression moved away from land making its exit through Vigan, Ilocos Sur, fresh warm moist air had intensified its maximum wind to 65 kph thus becoming a tropical storm. It moved out of the Philippine Area of Responsibility on July 8 reaching its intensity near the Prates Island as another typhoon approaches the country. The combined effect of the two disturbances brought more monsoon rains over the Western Sections of Luzon bringing 46.5 mm of maximum 24 hour rainfall at Tugueggarao, Cagayan at a minimum sea level pressure of 1000.3 mbs.

② TYPHOON GLORING (JULY 17 - 20, 1972)

Typhoon Gloring did not directly hit the country for it got only as near as 1,110 kms east of Aparri, Cagayan on the 12th of July. The destructive floods that happened furing its passage was caused by the southwest air flow that brought monsoon rains.

This typhoon had its insipience as a low pressure area during the first week of July near Truk Island with its winds being intensified to 55 kph on July 6. Gloring gained strength on the 8th and became a full blown typhoon with center winds of 150 kph on the 9th. It further gained strength, that on the 10th it reached the height of its matured stage with maximum winds of 273 kph and gustiness reaching up to 325 kph. The minimum sea level pressure recorded was 895 mbs and the maximum rainfall was 479.6 mm over Baguio City for a 24 hour duration on the 17th.

The massive lifting of warm moist air on the South China Sea with the winds coming from the southwest caused the heavy rainfall from the 17th to the 21st. From this point on and during the remainder of its ocean track, it began to lose strength until July 26 when it dissipated after meandering over the ocean for quite a long time.

③ TYPHOON HUANING (JULY 21 - 31, 1972)

Typhoon Huaning began as an active low pressure area with maximum winds of 55 kph moving in a westerly course at an average speed of 7 knots. It sped out of the country crossing through Formosa on the 30th with a departure speed of 12 kph and later degenerated off the coast of Southern China Mainland. The lowest pressure estimated was 999 mbs over the ocean.

④ TROPICAL DEPRESSION ISANG (JULY 29 - AUGUST 1, 1972)

Isang originated from a broad low pressure area at 19.0°N, 133.5°E on July 26 and later developed into a depression on the 29th at 980 kms almost east-southeast of Basco, Batanes with maximum winds of 55 kph. It remained quasi-stationary at a point 685 kms east of Basco at a minimum sea-level pressure of 999 mbs on July 31st. Flood waters over Central Luzon was caused by the various rains brought by the southwest monsoon. Maximum 24 hour rainfall recorded was 217.9 mm at Science Garden, Quezon City.

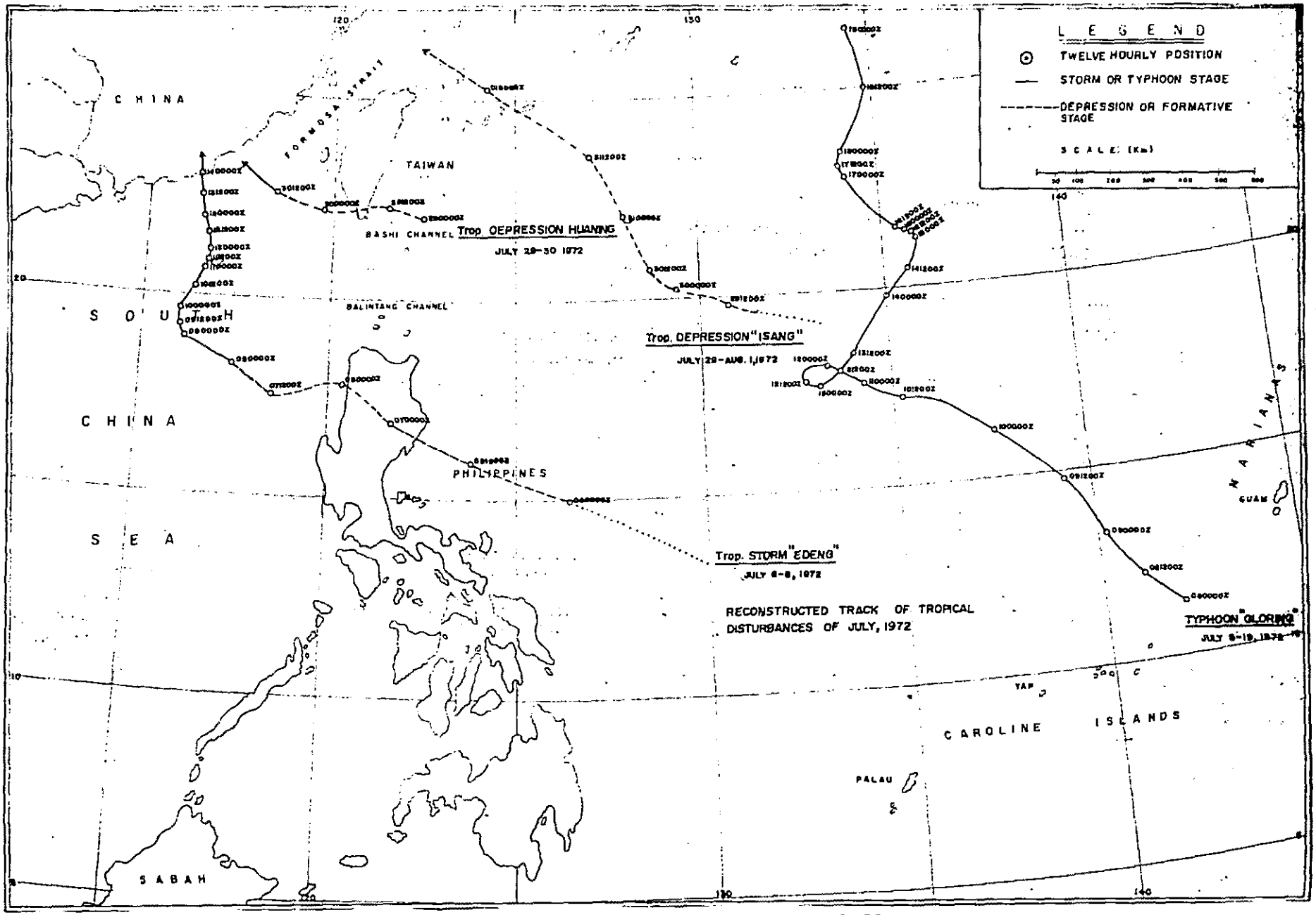

Fig. B.4.1 Typhoon Track July 1972

Table B.4.2 Hourly Rainfall (2) July 6, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 6 — 1972

No.	22	33	32	28	39	31	35	52	47	48
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Gapan	Ipo Junction	Sabang	Aparlit
0 – 1										
2										
3							0.5			
4										
5										
6										
7										
8										1.5
9										1
10	1.5	1.5		0.5						4
11	2	3.9	3.1	2.5	0.6		3.1			3
12	2.5	4.4	4.6	3	4		5.1			
13	2.5	1.5	2.6	1.5	1.1		1			
14	1			0.5	1.1					
15	1		0.5		0.6		0.5			
16										
17									1.5	1
18			0.5				0.5		0.5	10.9
19					2.3					1.5
20	4.0	1	3.6	0.5	0.6					1
21	3.5	2.45	6.6	9.1	2.3		9.2			10.4
22	1.5	5	4.6	2.5	19.4		17.8			4
23		4.4	2.6	2	4.6		5.1			3.5
23 – 24	0.5	5	2.6	0.5	3.4		7.1			8.4
Total	20.0	51.2	31.3	22.6	40.0		49.9		2.0	51.2
8–8	118.9	177.0	125.8	24.1	99.9		163.2		2.0	85.9

Table B.4.1 Hourly Rainfall (1) July 5, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 5 — 1972

No.	22	33	32	28	39	31	35	52	47	48
Time \ Gaging Station	PRIS Dam	Mallorca	Lamlakin	Zaragoza	San Agustin	San Miguel	Gapan	Ipo Junction	Sabang	Aparlit
0 – 1										
2										
3										
4				0.6						
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17									2	
18										
19										
20										
21				0.6					2	
22									7.9	
23										
23 – 24										
Total				1.2					11.9	
8–8				0.6			0.5		11.9	1.5

Table B.4.4 Hourly Rainfall (4) July 8, 1972

Daily summary of hourly rainfall (mm) at different stations

River System : Pampanga — July 8 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capan	Ipo Junction	Sabang	Apalit	
0 – 1	1.5	5.9	5.6	·	16.5	·	6.1	·	·	7.	·
2	4.9	4.4	7.1	·	31.9	·	14.3	·	·	7.	·
3	4.5	7.9	12.6	·	23.1	·	8.7	·	·	15.	·
4	10.4	12.9	6.1	·	11.	·	20.9	·	0.5	2.5	·
5	5.9	6.4	11.6	·	18.7	·	11.2	·	·	·	·
6	4.9	15.8	4.0	·	6.1	·	18.9	·	·	0.5	·
7	1.5	0.5	1.	·	0.6	·	2.6	·	·	1.	·
8	2.0	0.5	·	·	0.6	·	·	·	1.5	5.	·
9	0.5	0.5	2.5	·	0.6	·	5.6	·	1.	3.5	·
10	4.4	2.1	4.5	·	12.4	·	3.5	·	1.5	3.5	·
11	7.9	4.1	2.5	·	9.6	·	5.1	·	3.5	1.5	·
12	2.5	3.6	3.	·	2.3	·	0.5	·	3.5	8.	·
13	2.5	3.6	1.5	·	4.5	·	0.5	·	·	·	·
14	2.	·	0.5	·	0.6	·	·	·	·	0.5	·
15	2.	1.	·	·	0.6	·	·	·	·	·	·
16	·	·	0.5	·	·	·	0.5	·	·	·	·
17	·	·	1.5	·	0.6	·	·	·	0.5	·	·
18	0.5	·	·	·	·	·	·	·	1.5	0.5	·
19	0.5	·	·	·	·	·	·	·	3.5	·	·
20	·	·	·	·	·	·	0.5	·	1.5	·	·
21	0.5	·	·	·	·	·	·	·	5.5	·	·
22	0.5	·	·	·	·	·	·	·	25.0	·	·
23	·	·	·	·	·	·	·	·	8.	·	·
23–24	·	·	·	·	·	·	·	·	13.	·	·
Total	59.4	69.2	64.4	·	139.7	·	98.9	·	70.0	55.5	·
8–9	27.8	14.9	19.5	·	31.8	·	16.2	·	14.5.3	22.5	·

Table B.4.3 Hourly Rainfall (3) July 7, 1972

Daily summary of hourly rainfall (mm) at different stations

River System : Pampanga — July 7 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capan	Ipo Junction	Sabang	Apalit	
0 – 1	7.9	11.8	8.7	1.5	5.7	·	19.9	·	·	4.	·
2	7.4	21.6	18.4	·	12.5	·	18.9	·	·	5.9	·
3	6.9	26.0	9.2	·	8.0	·	22.4	·	·	3.5	·
4	24.7	28.2	15.7	·	3.4	·	11.2	·	·	5.9	·
5	19.8	9.3	13.3	·	5.7	·	14.3	·	·	4.9	·
6	14.4	9.8	13.8	·	8.6	·	13.4	·	·	4.5	·
7	7.4	8.3	7.7	·	10.3	·	7.6	·	·	4.5	·
8	10.4	10.8	7.7	·	5.7	·	6.1	·	·	1.5	·
9	13.4	5.4	5.6	·	2.8	·	4.6	·	·	1.5	·
10	16.8	2.0	2.5	·	1.1	·	2.6	·	·	1.	·
11	14.8	1.0	·	·	1.1	·	0.5	·	·	0.5	·
12	5.4	0.5	1.0	·	1.7	·	0.5	·	3.5	2.	·
13	3.0	1.5	0.5	·	0.6	·	1.0	·	·	2.	·
14	1.5	0.5	0.5	·	0.6	·	0.5	·	·	2.	·
15	1.5	·	0.5	·	0.6	·	0.5	·	·	1.5	·
16	2.0	·	0.5	·	0.6	·	·	·	13.4	1.5	·
17	0.5	0.5	·	·	0.6	·	1.0	·	0.5	·	·
18	4.5	0.5	2.0	·	3.8	·	·	·	0.5	9.	·
19	0.5	0.5	2.0	·	12.1	·	·	·	·	·	·
20	1.5	6.9	12.1	·	9.4	·	6.1	·	·	1.	·
21	4.9	5.0	20.7	·	7.7	·	5.1	·	·	2.5	·
22	12.8	7.9	30.8	·	15.4	·	10.7	·	·	1.	·
23	10.9	2.6	7.6	·	22.0	·	33.2	·	·	2.5	·
23–24	2.0	3.5	4.5	·	13.2	·	13.3	·	·	8.	·
Total	194.9	164.1	183.3	1.5	153.2	·	193.4	·	17.9	70.7	·
8–8	131.6	92.6	138.8	0.	201.8	·	162.3	·	19.9	74.0	·

Table B.4.6 Hourly Rainfall (6) July 10, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 10 — 1972

Time \ Gaging Station	No. 22 PRIS Dam	33 Hallorca	32 Lambakin	28 Zaragoza	39 San Agustin	31 San Miguel	35 Gapan	52 Ipo Junction	47 Sabang	48 Aparlit	
0–1	1·	2·1	·	·	·	·	0·5	·	18·5	·	·
2	1·9	0·5	0·6	·	·	·	·	·	31·5	·	·
3	1·9	·	·	·	·	·	·	·	5·5	·	·
4	2·4	·	·	·	·	·	·	·	11·5	·	·
5	3·8	0·5	12·2	·	·	·	3·6	·	2·5	·	·
6	8·7	4·1	·	·	·	·	1·	·	2·	·	·
7	0·5	·	0·5	·	·	·	·	·	·	·	·
8	·	·	·	·	·	·	1·	·	3·5	·	·
9	·	·	5·2	·	10·5	·	0·5	·	6·	10·	·
10	3·4	0·5	1·6	·	·	·	·	·	13·5	·	·
11	2·	0·5	1·6	·	·	·	·	·	3·5	·	·
12	2·4	0·5	0·5	·	·	·	0·5	·	0·5	·	·
13	4·9	·	4·2	·	·	·	0·5	·	4·0	·	·
14	6·9	2·6	·	·	·	·	1·5	·	0·5	18·5	·
15	0·5	0·5	·	·	·	·	·	·	·	·	·
16	14·7	1·1	4·2	·	·	·	1·0	·	·	·	·
17	6·4	6·3	12·	·	·	·	3·6	·	·	·	·
18	6·9	5·8	18·7	·	0·6	·	·	·	·	·	·
19	3·4	3·2	5·2	·	1·7	·	0·5	·	·	·	·
20	0·5	5·3	2·6	·	11·0	·	4·1	·	·	·	·
21	2·	2·6	1·6	·	3·3	·	3·6	·	·	·	·
22	1·	3·8	1·6	·	1·1	·	4·6	·	·	·	·
23	2·9	2·1	0·5	·	0·6	·	1·5	·	·	·	·
23–24	0·5	·	·	·	0·6	·	·	·	·	·	·
Total	78·6	42·0	72·7	·	29·4	·	28·0	·	103·0	28·5	·
6–8	62·8	34·8	59·5	·	31·4	·	21·9	·	44·0	28·5	·

Table B.4.5 Hourly Rainfall (5) July 9, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 9 — 1972

Time \ Gaging Station	No. 22 PRIS Dam	33 Hallorca	32 Lambakin	28 Zaragoza	39 San Agustin	31 San Miguel	35 Gapan	52 Ipo Junction	47 Sabang	48 Aparlit	
0–1	·	·	·	·	·	·	·	·	17·5	·	·
2	·	·	3·	·	·	·	·	·	8·5	·	·
3	0·5	·	·	·	·	·	·	·	12·5	·	·
4	3·	·	·	·	·	·	·	·	11·5	·	·
5	·	·	·	·	·	·	·	·	6·3	·	·
6	·	·	·	·	·	·	·	·	7·5	·	·
7	·	·	·	·	·	·	·	·	8·0	·	·
8	0·5	·	·	·	0·6	·	·	·	5·5	·	·
9	·	2·1	5·1	·	5·8	·	3·6	·	3·0	1·5	·
10	5·3	3·1	1·5	·	6·3	·	1·5	·	2·0	1·	·
11	1·	0·5	·	·	0·5	·	0·5	·	2·5	0·5	·
12	0·5	·	·	·	0·5	·	1·5	·	1·5	·	·
13	1·9	1·	3·1	·	0·5	·	·	·	1·	·	·
14	1·4	·	1·5	·	·	·	0·5	·	1·5	1·	·
15	1·	0·5	0·5	·	·	·	·	·	0·5	·	·
16	0·5	·	·	·	·	·	0·5	·	1·5	·	·
17	·	·	0·5	·	·	·	·	·	1·5	·	·
18	1·4	·	1·5	·	0·5	·	·	·	3·	·	·
19	·	·	·	·	·	·	·	·	13·5	·	·
20	·	·	·	·	·	·	·	·	1·5	·	·
21	1·4	0·5	·	·	0·5	·	0·5	·	7·5	·	·
22	3·8	0·5	·	·	17·3	·	11·2	·	27·	28·3	·
23	11·6	6·2	·	·	21·5	·	4·1	·	10·	0·5	·
23–24	4·8	4·1	·	·	·	·	2·6	·	11·	·	·
Total	38·6	18·5	16·7	·	54·0	·	26·5	·	165·8	32·8	·
18–8	54·8	25·7	26·9	·	53·4	·	32·6	·	163·0	32·8	·

Table B.4.8 Hourly Rainfall (8) July 16, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 16 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capas	Ipo Junction	Sabang	Apalit	
0 – 1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	2·	.	.
3	.	.	.	.	.	.	.	.	1·	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	0·5	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	0·5	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	1·2	.	.	.	.	.	.
11	.	.	.	.	.	.	0·5	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	0·5	.	.
14	.	.	3·5	.	.	.	.	.	.	.	.
15	.	0·5	.	.	.	.	15·5	.	3·0	.	.
16	.	2·2	.	.	.	.	0·5	.	1·4	.	.
17	.	1·1	1·0	.	.	.	0·5	.	.	.	.
18	12·7	.	0·5	.	.	.	0·5	.	2·0	.	.
19	.	1·6	.	.	.	.	.	.	.	.	.
20	.	1·6	.	.	.	.	0·5	.	.	.	.
21	.	.	.	.	.	.	0·5	.	.	.	.
22	.	.	.	.	.	.	.	.	0·5	.	.
23	.	.	.	.	.	.	.	.	.	.	.
23–24	.	.	.	.	.	.	.	.	1·	.	.
Total	12·7	7·0	5·0	·	1·2	·	18·5	·	12·4	·	·
6–8	14·7	7·0	5·0	·	4·2	·	18·5	·	9·4	2·0	·

Table B.4.7 Hourly Rainfall (7) July 1, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 15 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capas	Ipo Junction	Sabang	Apalit	
0 – 1	1·9	.	.	.	0·5	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	0·5	.	.	.	.	.	.
4	0·5	.	.	1·0	.	.	.	.	.	.	.
5	1·5	.	.	.	.	.	.	.	0·5	.	.
6	.	.	.	.	.	.	.	.	0·5	.	.
7	.	.	.	.	.	.	.	.	4·5	.	.
8	0·5	.	.	.	1·0	.	.	.	10·5	.	.
9	.	.	.	.	.	.	.	.	9·8	0·5	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	4·3	.	.	.	.	.	.	.	.
12	.	.	1·1	.	.	.	.	.	.	1·0	.
13	.	0·5	.	.	.	.	.	.	.	.	.
14	.	.	9·4	.	0·6	.	.	.	.	.	.
15	.	.	.	.	.	.	0·5	.	.	.	.
16	.	9·5	.	.	.	.	.	.	.	.	.
17	.	.	.	.	0·6	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	0·5	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	0·5	.	.
21	.	.	.	.	.	.	.	.	6·4	.	.
22	.	.	.	.	0·6	.	.	.	2·5	.	.
23	.	.	.	.	.	.	.	.	.	.	.
23–24	.	.	.	.	.	.	.	.	1·0	0·5	.
Total	4·4	10·0	14·8	1·0	3·8	·	0·5	·	36·7	2·0	·
18–6	·	10·0	14·8	·	1·8	·	0·5	·	24·7	2·0	·

Table B.4.10 Hourly Rainfall (10) July 18, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 18 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capan	Ipo Junction	Sabang	Apalit	
0~1	6·4	0·5	2·5	·	4·5	·	1·5	·	·	17·	·
2	6·9	2·4	3·5	·	13·0	·	·	·	·	16·	·
3	14·4	3·4	5·0	·	14·5	·	2·6	·	·	17·	·
4	14·4	3·8	1·5	·	3·5	·	5·1	·	·	28·5	·
5	4·0	2·4	4·5	·	5·0	·	5·6	·	·	12·5	·
6	1·0	0·5	10·0	·	3·5	·	4·1	·	·	18·	·
7	14·4	8·5	4·5	·	5·5	·	3·1	·	·	14·	·
8	4·0	8·2	5·5	·	7·5	·	6·1	·	·	19·	·
9	2·6	6·8	1·5	0·5	·	·	8·7	·	·	21·	·
10	1·6	2·4	3·0	·	·	·	3·6	·	·	8·	·
11	2·1	1·0	5·0	4·1	·	·	3·6	·	·	29·	·
12	1·6	2·9	6·5	5·7	·	·	2·0	·	·	8·	·
13	3·1	4·9	2·0	2·6	·	·	2·6	·	0·5	19·	·
14	1·0	2·4	1·0	7·7	·	·	4·1	·	·	26·	·
15	0·5	6·9	0·5	0·5	·	·	2·0	·	·	16·	·
16	1·0	0·5	1·0	·	·	·	3·6	·	·	8·5	·
17	·	·	2·5	0·5	·	·	·	·	·	5·5	·
18	0·5	1·4	2·5	·	·	·	2·6	·	·	4·	·
19	0·5	0·5	3·0	·	Defective	·	2·0	·	·	7·	·
20	0·5	1·0	1·0	0·5	·	·	1·0	·	·	1·5	·
21	0·5	0·5	1·0	0·5	·	·	2·6	·	·	2·5	·
22	·	0·5	1·5	0·5	·	·	0·5	·	·	3·5	·
23	·	·	6·5	2·6	·	·	0·5	·	·	1·5	·
23~24	·	0·5	11·5	2·1	·	·	·	·	·	0·5	·
Total	81·0	61·9	87·0	27·8	·	·	67·5	·	0·5	303·5	·
6~6	56·0	104·3	140·0	73·2	·	·	139·3	·	0·5	282·0	·

Table B.4.9 Hourly Rainfall (9) July 17, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 17 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capan	Ipo Junction	Sabang	Apalit	
0~1	·	·	·	·	·	·	·	·	1·0	·	·
2	0·5	·	·	·	·	·	·	·	·	·	·
3	·	·	·	·	1·2	·	·	·	·	1·	·
4	0·5	·	·	·	1·2	·	·	·	·	·	·
5	·	·	·	·	·	·	·	·	·	·	·
6	0·5	·	·	·	·	·	·	·	·	·	·
7	·	·	·	·	0·6	·	·	·	·	·	·
8	0·5	·	·	·	·	·	·	·	·	1·	·
9	·	0·5	6·0	·	1·5	·	0·5	·	·	7·	·
10	0·5	0·5	2·5	·	3·0	·	1·5	·	·	1·5	·
11	·	3·8	1·	·	2·5	·	0·5	·	·	0·5	·
12	2·0	2·4	3·	·	1·	·	6·1	·	·	·	·
13	3·0	1·4	0·5	·	1·	·	2·	·	·	1·0	·
14	3·0	0·5	0·5	·	0·5	·	0·5	·	·	1·5	·
15	·	1·4	·	·	0·5	·	3·1	·	·	2·	·
16	·	0·5	·	·	2·	·	3·1	·	·	3·	·
17	0·5	·	·	·	1·5	·	0·5	·	·	3·	·
18	·	0·5	·	·	2·	·	·	·	·	4·	·
19	·	·	2·	·	6·	·	0·5	·	·	2·	·
20	·	·	1·5	·	6·5	·	·	·	·	4·	·
21	·	0·5	2·	·	1·5	·	·	·	·	4·	·
22	1·	0·5	0·5	·	5·5	·	2·6	·	·	9·	·
23	3·	0·5	0·5	·	4·5	·	1·5	·	·	16·	·
23~24	4·5	·	4·5	·	2·	·	0·5	·	·	12·	·
Total	19·5	13·0	24·5	·	44·5	·	22·9	·	1·0	66·5	·
6~6	83·0	42·7	61·5	·	98·5	·	51·0	·	0·5	212·5	·

Table B.4.12 Hourly Rainfall (12) July 20, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 20 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capas	Ipo Junction	Sabang	Aplit	
0~1	1·	1	1	1·5	2·5	·	2·6	·	9·5	2·	·
2	1·	·	·	·	1·5	·	0·5	·	12·	3·	·
3	1·5	·	·	0·5	·	·	·	·	9·	5·6	·
4	0·5	·	·	·	·	·	0·5	·	9·	11·1	·
5	·	·	·	·	·	·	0·5	·	14·	4·	·
6	0·5	·	·	·	·	·	·	·	6·5	12·2	·
7	0·5	·	·	·	·	·	·	·	9·	5·1	·
8	·	·	·	·	·	·	·	·	8·	4·	·
9	·	0·5	·	·	·	·	·	·	12·	7·	·
10	·	·	0·5	·	·	·	·	·	23·	9·	·
11	·	·	·	·	·	·	·	·	5·	6·	·
12	·	·	0·5	·	·	·	·	·	12·	6·	·
13	1·4	·	0·5	·	·	·	·	·	2·5	6·	·
14	1·	·	·	·	·	·	·	·	13·	4·	·
15	·	·	·	·	·	·	0·5	·	11·5	2·	·
16	0·5	·	2·5	·	·	·	·	·	9·5	10·	·
17	1·5	0·5	·	·	·	·	·	·	3·	5·	·
18	1·9	1·9	5·0	·	·	·	2·6	·	4·5	4·	·
19	1·5	2·4	2·	·	·	·	4·2	·	4·	2·5	·
20	1·5	1·9	4·	·	·	·	3·7	·	1·	8·5	·
21	1·	·	0·5	·	·	·	1·1	·	1·5	3·	·
22	0·5	·	1·	·	·	·	0·5	·	3·	5·5	·
23	0·5	1·4	2·5	·	·	·	1·6	·	3·5	8·5	·
23~24	1·	1·4	3·5	·	·	·	3·7	·	1	8	·
Total	17·3	11·0	23·5	2·0	4·0	·	22·0	·	189·0	142·0	·
6~8	17·8	15·8	34·5	·	·	·	35·9	·	173·5	163·0	·

Table B.4.11 Hourly Rainfall (11) July 19, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 19 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capas	Ipo Junction	Sabang	Aplit	
0~1	1·0	0·5	9·0	3·1	↑	·	0·5	·	·	16·	·
2	11·4	10·8	3·5	5·2	·	·	1·5	·	·	3·5	·
3	4·2	4·9	9·5	4·1	defective	·	25·5	·	·	5·	·
4	5·7	4·9	13·5	5·2	·	·	6·1	·	·	2·	·
5	3·6	9·8	18·0	4·1	·	·	14·3	·	·	19·	·
6	1·6	12·3	7·5	5·1	·	·	10·7	·	·	16·	·
7	5·2	20·1	18·0	12·9	·	·	23·5	·	·	36·	·
8	7·8	8·8	11·0	5·7	↓	·	17·8	·	·	23·	·
9	2·9	14·6	7·1	5·1	6·9	·	16·3	·	0·5	25·3	·
10	4·9	13·6	5·1	6·1	48·5	·	16·3	·	3·5	16·7	·
11	2·4	6·4	8·2	1·5	·	·	12·7	·	·	15·7	·
12	2·9	2·9	2·0	5·6	·	·	3·6	·	0·5	4·5	·
13	0·5	3·4	5·6	5·1	·	·	4·1	·	3·0	6·6	·
14	1·0	8·8	4·6	6·1	·	·	4·6	·	3·0	1·5	·
15	·	1·0	2·0	0·5	·	·	1·5	·	1·5	1·5	·
16	·	4·9	4·6	4·6	·	·	1·5	·	3·	10·6	·
17	·	4·4	2·0	4·1	·	·	5·1	·	2·5	12·7	·
18	0·5	5·4	3·6	7·1	7·9	·	7·6	·	4·5	6·1	·
19	3·4	2·9	4·6	4·1	5·4	·	8·2	·	3·	4·5	·
20	1·5	1·0	1·0	2·0	4·0	·	1·0	·	3·5	1·	·
21	2·4	2·4	1·5	3·6	3·5	·	4·1	·	3·	4·5	·
22	2·4	1·9	2·6	2·0	5·0	·	4·1	·	1·5	5·1	·
23	1·9	1·0	·	1·5	3·5	·	2·6	·	2·5	2·	·
23~24	3·4	1·0	·	1·5	4·5	·	0·5	·	2·	6·5	·
Total	70·6	187·7	144·5	105·9	·	·	193·7	·	37·5	239·3	·
6~8	35·1	76·6	55·5	62·5	·	·	97·9	·	11·5	17·8	·

Table B.4.14 Hourly Rainfall (14) July 27, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 27 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capan	Ipo Junction	Sabang	Apalit	
0~1	1·	0·5	1·	1·1	2·1	·	1·5	·	·	12·5	·
2	0·5	0·5	0·5	1·1	3·2	·	0·5	·	4·5	17·5	·
3	·	·	0·5	0·5	2·1	·	·	·	·	24	·
4	·	·	0·5	1·1	1·1	·	·	·	·	3·	·
5	·	0·5	0·5	5·9	2·1	·	0·5	·	·	3·5	·
6	·	1·	1·	·	0·5	·	1·	·	·	1·5	·
7	·	2·	1·	·	0·5	·	1·5	·	·	·	·
8	·	0·5	0·5	·	0·5	·	·	·	·	·	·
9	1·9	1·	·	1·5	2·5	·	0·5	·	0·5	0·5	·
10	0·5	1·	4·	9·	5·	·	1·5	·	·	·	·
11	3·4	4·8	3·5	4·	14·4	·	6·6	·	·	11·5	·
12	1·	3·8	4·	5·	8·9	·	4·6	·	0·5	4·0	·
13	1·4	3·3	2·	2·	3·8	·	4·1	·	1·9	1·	·
14	1·	1·9	1·5	1·5	3·8	·	1·	·	1·9	3·	·
15	11·4	2·9	7·5	7·	11·4	·	2·6	·	0·5	0·5	·
16	6·7	11·4	4·	4·	10·4	·	9·7	·	1·	41·5	·
17	·	1·9	2·	4·5	4·6	·	2·	·	·	6·	·
18	4·3	1·4	1·5	2·5	3·	·	2·6	·	·	5·5	·
19	·	1·4	0·5	·	0·5	·	2·6	·	0·5	0·5	·
20	2·9	1·4	2·5	2·	0·5	·	1·	·	0·5	5·5	·
21	0·5	2·9	3·5	1·	0·5	·	5·6	·	0·5	2·	·
22	0·5	0·5	1·	·	·	·	·	·	0·5	·	·
23	·	4·8	3·5	0·5	1·	·	·	·	·	2·5	·
23~24	1·	1·4	0·5	0·5	3·5	·	6·6	·	·	·	·
Total	38·0	50·8	47·0	54·1	·	·	56·0	·	12·8	146·0	·
18~6	51·9	64·9	71·0	77·0	·	·	66·8	·	9·3	126·0	·

Table B.4.13 Hourly Rainfall (13) July 21, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 21 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capan	Ipo Junction	Sabang	Apalit	
0~1	1·	1·4	1·5	·	·	·	2·6	·	·	12·	·
2	0·5	0·5	1·	·	·	·	2·1	·	5·5	6·	·
3	0·5	0·5	2·	·	·	·	1·6	·	3·5	5·	·
4	1·	1·	2·	·	·	·	3·2	·	6·5	3·	·
5	1·	1·4	1·	·	·	·	3·2	·	8·0	4·5	·
6	1·	0·5	2·	·	·	·	2·1	·	8	32·5	·
7	0·5	·	0·5	·	·	·	1·6	·	19·5	4·	·
8	·	0·5	2·	·	·	·	1·6	·	12·5	1·	·
9	0·5	1·	1·	·	·	·	2·0	·	18	·	·
10	0·5	1·	1·5	2·1	·	·	0·5	·	17·5	·	·
11	1·5	1·	1·5	0·5	·	·	1·5	·	7·5	·	·
12	1·5	3·8	2·	·	·	·	3·1	·	8	·	·
13	1·5	2·4	1·	1·1	1·8	·	3·1	·	4·	·	·
14	1·	0·5	2·	0·5	1·8	·	0·5	·	5·	·	·
15	·	1·	2·	·	1·8	·	0·5	·	3·5	·	·
16	·	0·5	3·	1·1	1·8	·	0·5	·	6·5	·	·
17	·	·	1·	2·6	·	·	·	·	6·5	·	·
18	·	·	0·5	·	·	·	·	·	11·	·	·
19	·	·	·	·	·	·	·	·	6·	·	·
20	·	·	·	0·5	·	·	·	·	2·5	·	·
21	·	·	·	3·7	·	·	·	·	0·5	·	·
22	·	·	·	7·9	·	·	·	·	3·5	·	·
23	·	·	0·5	1·1	·	·	·	·	3·	·	·
23~24	·	·	·	·	·	·	·	·	1·	·	·
Total	12·0	16·5	28·0	21·1	7·2	·	29·7	·	167·5	·	·
18~6	·	·	·	·	·	·	·	·	·	·	·

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Table B.4.16 Hourly Rainfall (16) July 29, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 29 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Gapan	Ipo Junction	Sabang	Apalit	
0 – 1	10·4	7·2	8·8	7·5	5·9	·	9·2	·	3·5	9·	·
2	16·4	10·1	2·6	9·	7·9	·	11·2	·	7·	3·	·
3	8·4	6·2	5·2	9·	3·	·	10·2	·	6·	4·	·
4	1·5	2·9	7·2	6·5	4·	·	9·1	·	6·5	0·5	·
5	2·	5·8	0·5	5·5	2·	·	9·2	·	1·	0·5	·
6	1·5	3·8	1·	2·5	1·	·	5·6	·	1·	·	·
7	0·5	·	0·5	·	0·5	·	0·5	·	0·5	0·5	·
8	0·5	3·8	·	0·5	·	·	3·1	·	0·5	6·	·
9	·	·	1·	1·	·	·	1·5	·	·	6·	·
10	0·5	1·	0·5	2·	2·	·	1·	·	0·5	10·	·
11	·	2·	·	0·5	2·5	·	4·	·	·	3·	·
12	·	·	·	·	0·5	·	0·5	·	4·	1·5	·
13	·	·	1·	·	0·5	·	·	·	5·5	·	·
14	·	1·	2·5	0·5	·	·	·	·	2·	0·5	·
15	·	1·5	0·5	0·5	1·5	·	1·5	·	1·5	1·5	·
16	0·5	1·5	4·	·	1·5	·	1·5	·	1·	1·5	·
17	1·	1·	1·	2·	·	·	1·	·	3·5	2·5	·
18	1·9	2·	4·	2·5	0·5	·	7·6	·	0·5	1·	·
19	0·5	2·	1·5	3·	3·9	·	2·	·	12·	·	·
20	1·	2·9	0·5	0·5	1·5	·	3·5	·	1·	9·	·
21	1·	·	1·5	·	2·9	·	1·	·	0·5	·	·
22	1·4	0·5	0·5	0·5	0·5	·	·	·	5·	·	·
23	0·5	0·5	10·6	1·5	0·5	·	2·	·	1·5	4·5	·
23–24	4·8	1·	2·	6·1	·	·	·	·	0·5	4·	·
Total	54·3	56·7	46·9	61·1	42·6	·	83·2	·	65·0	13·5	·
8–8	51·2	49·6	44·7	34·7	70·6	·	101·4	·	57·0	107·5	·

Table B.4.15 Hourly Rainfall (15) July 28, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 28 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Gapan	Ipo Junction	Sabang	Apalit	
0 – 1	·	·	0·5	·	1·	·	0·5	·	·	6·	·
2	·	1·9	2·5	0·5	1·	·	·	·	·	1·	·
3	1·	1·	·	·	0·5	·	2·6	·	·	0·5	·
4	1·	1·9	3·	3·5	5·	·	1·5	·	·	23·5	·
5	1·4	1·4	10·	9·	1·	·	2·6	·	·	9·	·
6	2·9	8·6	7·	1·9	2·	·	2·	·	·	1·5	·
7	5·7	1·9	4·5	·	4·	·	2·	·	1·	0·5	·
8	3·4	2·4	2·	·	2·5	·	4·6	·	·	·	·
9	2·5	1·	4·6	2·5	0·5	·	3·1	·	·	2·5	·
10	0·5	2·9	3·1	5·	·	·	1·5	·	·	1·5	·
11	3·5	4·8	5·7	5·5	5·4	·	7·6	·	·	·	·
12	0·5	1·4	5·7	3·	1·	·	1·5	·	·	4·	·
13	0·5	2·9	4·	2·5	2·5	·	1·5	·	·	1·	·
14	2·	2·4	0·5	11·5	5·4	·	1·5	·	·	1·5	·
15	1·	2·4	3·1	1·5	5·9	·	1·5	·	·	1·5	·
16	0·5	1·	2·6	1·5	3·	·	1·5	·	7·5	3·	·
17	0·5	2·4	5·7	1·5	1·	·	5·6	·	·	2·	·
18	·	1·4	0·5	2·5	2·5	·	1·5	·	·	9·	·
19	4·5	5·8	4·6	3·	3·5	·	9·7	·	·	8·	·
20	1·	0·5	16·5	1·5	4·	·	0·5	·	·	3·5	·
21	2·5	6·7	1·5	12·	1·5	·	2·	·	·	1·5	·
22	6·4	4·8	3·6	2·	5·9	·	13·3	·	·	0·5	·
23	1·5	1·4	8·7	5·	2·5	·	1·	·	·	7·5	·
23–24	5·4	5·8	12·4	13·	·	·	6·6	·	2·	9·5	·
Total	48·2	66·7	112·3	105·5	61·6	·	75·7	·	10·5	98·0	·
8–8	74·0	87·4	108·6	114·0	68·9	·	123·6	·	35·5	80·0	·

Table B.4.18 Hourly Rainfall (18) July 31, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 31 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capas	Ipo Junction	Sabang	Aparlit	
0~1	·	6·7	1·	5·5	4·1	·	6·1	·	6·5	2·	·
2	6·5	2·4	0·5	2·	2·6	·	7·6	·	3·	1·5	·
3	·	1·6	0·5	·	1·	·	4·	·	2·	1·	·
4	·	0·5	1·5	0·5	2·1	·	0·5	·	5·	0·5	·
5	·	0·5	0·5	0·5	2·1	·	2·	·	1·	2·	·
6	·	·	2·	2·	2·6	·	0·5	·	1·	1·5	·
7	0·5	1·	6·1	·	5·2	·	1·5	·	·	3·	·
8	·	1·	4·	·	5·2	·	4·	·	·	1·5	·
9	·	7·8	·	0·5	3·5	·	8·7	·	6·	6·	·
10	·	1·	·	·	1·5	·	0·5	·	1·5	4·	·
11	·	·	5·7	·	3·	·	1·	·	3·	3·	·
12	·	·	1·	0·5	2·	·	0·5	·	8·5	6·	·
13	·	1·	·	1·	3·	·	0·5	·	2·	2·5	·
14	·	1·5	1·	1·	1·5	·	4·1	·	·	0·5	·
15	0·5	·	·	6·2	1·	·	0·5	·	2·5	0·5	·
16	·	1·	4·1	0·5	0·5	·	1·	·	2·5	2·	·
17	·	·	2·6	2·6	4·	·	·	·	·	·	·
18	·	2·4	·	0·5	8·5	·	4·6	·	6·5	9·	·
19	·	1·	·	·	2·	·	1·	·	1·5	5·	·
20	·	·	·	·	1·5	·	1·	·	·	12·	·
21	0·5	·	·	·	6·	·	·	·	3·	4·	·
22	·	·	3·1	0·5	2·	·	·	·	·	1·5	·
23	8·	0·5	1·5	5·2	3·	·	·	·	·	1·5	·
23~24	4·5	4·8	5·1	7·7	2·	·	2·	·	4·5	·	·
Total	20·5	34·7	40·2	36·7	69·9	·	51·6	·	60·0	70·5	·
6~8	35·0	46·3	53·4	73·5	69·5	·	54·4	·	41·5	108·5	·

Table B.4.17 Hourly Rainfall (17) July 30, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — July 30 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capas	Ipo Junction	Sabang	Aparlit	
0~1	4·3	8·3	2·	2·5	1·5	·	17·7	·	1·	2·5	·
2	9·6	1·5	2·	3·5	·	·	2·5	·	1·	8·	·
3	3·9	4·4	6·1	2·	11·8	·	3·5	·	0·5	1·	·
4	1·	6·8	3·	6·1	30·1	·	10·1	·	3·5	7·5	·
5	2·4	7·8	1·5	·	5·9	·	24·7	·	11·	26·	·
6	2·4	3·4	0·5	·	2·	·	14·8	·	0·5	10·5	·
7	0·5	0·5	·	·	0·5	·	1·	·	0·5	1·5	·
8	·	·	0·5	·	0·5	·	·	·	·	0·5	·
9	·	1·	3·	8·1	1·	·	·	·	·	9·	·
10	0·5	3·4	3·	3·5	1·	·	2·5	·	2·	5·	·
11	·	2·4	2·5	5·1	2·1	·	3·	·	2·	0·5	·
12	·	3·4	2·	3·5	0·5	·	2·5	·	0·5	0·5	·
13	·	4·3	3·6	2·5	0·5	·	3·5	·	1·5	0·5	·
14	1·	1·	0·5	2·5	1·	·	3·	·	0·5	0·5	·
15	·	1·4	·	0·5	4·6	·	0·5	·	0·5	0·5	·
16	0·5	·	·	0·5	0·5	·	·	·	2·	·	·
17	·	·	·	·	1·	·	·	·	1·	·	·
18	1·	·	14·1	0·5	0·5	·	·	·	0·5	3·	·
19	5·3	1·	9·6	24·2	·	·	·	·	5·	9·5	·
20	8·2	34·1	4·	3·5	2·6	·	7·1	·	5·5	16·	·
21	1·9	4·8	7·6	5·3	2·1	·	14·6	·	2·5	13·5	·
22	·	2·9	11·7	8·1	3·1	·	4·	·	0·5	36·5	·
23	0·5	4·8	5·6	4·	0·5	·	5·6	·	3·	8·	·
23~24	1·4	6·2	4·5	4·5	3·1	·	5·6	·	4·	10·5	·
Total	44·4	103·4	89·6	91·4	76·4	·	126·2	·	49·0	176·0	·
6~8	27·3	84·4	87·8	86·8	49·0	·	83·7	·	49·5	131·5	·

Table B.4.20 Hourly Rainfall (20) Aug. 2, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — Aug. 2 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gagng Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capas	Ipo Junction	Sabang	Apalit	
0 ~ 1	1·5	·	·	2·	0·5	·	1·	·	·	9·	·
2	1·9	·	·	·	1·	·	3·5	·	·	6·	·
3	1·5	·	9·5	2·	3·1	·	·	·	·	5·	·
4	0·5	·	1·6	3·1	15·8	·	·	·	·	3·	·
5	·	4·	1·1	2·	5·6	·	·	·	·	3·	·
6	·	2·5	·	1·5	9·2	·	·	·	·	4·	·
7	0·5	0·5	1·1	1·5	·	·	·	·	·	7·	·
8	·	·	·	4·1	·	·	1·	·	·	7·5	·
9	0·5	·	0·5	·	3·	·	0·5	·	·	7·	·
10	·	0·5	1·	·	8·	·	1·5	·	·	5·	·
11	·	0·5	4·5	3·1	2·5	·	·	·	·	12·	·
12	0·5	2·4	2·5	2·6	7·5	·	0·5	·	·	3·5	·
13	·	1·4	8·6	2·6	3·	·	1·	·	·	4·5	·
14	·	4·8	3·5	3·7	16·	·	0·5	·	·	7·	·
15	1·4	3·3	3·5	1·	6·5	·	2·6	·	·	18·	·
16	1·4	2·9	3·5	0·5	14·5	·	1·	·	·	4·	·
17	1·4	1·4	3·	·	1·5	·	·	·	·	7·	·
18	·	1·9	0·5	1·6	0·5	·	1·5	·	·	3·	·
19	·	0·5	0·5	1·	0·5	·	0·5	·	·	6·	·
20	0·5	·	1·	1·	0·5	·	2·	·	·	5·	·
21	·	·	0·5	1·	4·	·	3·6	·	·	13·	·
22	·	0·5	0·5	1·	0·5	·	1·5	·	·	2·5	·
23	0·9	·	1·	1·	3·5	·	0·5	·	·	4·5	·
23–24	·	0·5	0·5	0·5	1·5	·	·	·	·	1·5	·
Total	12·5	27·6	48·4	36·8	108·7	·	22·2	·	·	148·0	·
6–6	6·6	24·1	40·6	22·1	81·0	·	35·5	·	·	99·5	·

Table B.4.19 Hourly Rainfall (19) Aug. 1, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — Aug. 1 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gagng Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capas	Ipo Junction	Sabang	Apalit	
0 ~ 1	10·5	1·5	5·1	2·1	3·5	·	·	·	·	3·	·
2	1·5	4·4	5·1	7·2	0·5	·	4·1	·	·	15·	·
3	·	2·4	6·2	8·2	·	·	1·5	·	·	6·	·
4	3·	3·9	4·1	15·4	6·	·	4·6	·	·	3·5	·
5	4·	4·9	3·1	7·7	2·5	·	5·1	·	·	2·5	·
6	1·5	5·3	2·1	3·1	3·	·	7·1	·	·	8·5	·
7	0·5	1·9	2·1	3·6	4·	·	5·1	·	·	9·5	·
8	0·5	1·	1·5	·	5·	·	1·5	·	·	6·	·
9	·	1·	·	·	6·1	·	1·	·	·	7·	·
10	·	2·5	·	·	2·	·	·	·	·	6·	·
11	·	·	0·5	·	3·1	·	2·	·	·	8·	·
12	·	·	2·1	1·5	2·6	·	3·5	·	·	36·	·
13	·	·	1·6	4·6	3·1	·	4·5	·	·	8·	·
14	0·5	1·5	3·2	2·6	4·1	·	2·	·	·	3·	·
15	·	1·	1·6	2·6	2·	·	11·1	·	·	22·	·
16	0·5	2·5	1·6	0·8	2·	·	2·5	·	·	10·	·
17	·	2·5	1·1	1·5	8·2	·	2·	·	·	11·	·
18	·	0·5	0·5	1·	3·6	·	3·5	·	·	4·	·
19	0·5	1·	0·5	0·5	2·	·	1·	·	·	1·5	·
20	1·5	0·5	·	1·	0·5	·	·	·	·	6·	·
21	·	0·5	1·1	0·5	0·5	·	1·	·	·	55·	·
22	·	·	0·5	2·	4·6	·	·	·	·	4·5	·
23	2·9	0·5	·	1·	2·	·	·	·	·	2·5	·
23–24	2·4	1·	·	0·5	0·5	·	0·5	·	·	·	·
Total	29·8	40·3	43·6	66·6	71·4	·	63·6	·	·	189·0	·
6–6	14·2	27·6	26·0	36·0	82·1	·	40·1	·	·	179·5	·

Table B.4.22 Hourly Rainfall (22) Aug. 4, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — Aug. 4 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capan	Ipo Junction	Sabang	Aparlit	
0~1	.	.	4·7	.	.	.	.	.	0·5	1·5	.
2	.	0·5	6·8	3·9	1·	.	.	.	5·	8·5	.
3	.	3·4	5·3	4·9	6·5	.	.	.	5·5	22·	.
4	.	5·7	0·5	7·3	5·5	.	5·1	.	9·	17·	.
5	.	3·8	0·5	1·5	5·5	.	2·6	.	3·5	4·	.
6	.	0·5	.	.	4·	.	.	.	2·	10·	.
7	.	1·	2·	0·5	5·5	.	.	.	3·	7·	.
8	3·7	1·9	.	1·	9·	.	.	.	5·5	2·8	.
9	7·8	1·	1·6	.	6·6	.	1·	.	6·5	27·3	.
10	2·9	1·	1·1	.	5·6	.	4·5	.	14·5	2·0	.
11	1·	2·4	3·7	1·5	8·7	.	2·5	.	6·5	15·	.
12	.	2·9	4·2	0·9	6·6	.	0·5	.	17·	14·	.
13	0·5	1·9	6·3	.	7·1	.	.	.	5·	4·	.
14	1·	1·9	1·1	1·5	6·1	.	.	.	26·5	0·5	.
15	1·5	1·	.	1·8	0·5	.	.	.	9·	.	.
16	0·5	.	.	1·2	0·5	.	.	.	1·5	.	.
17	.	.	.	1·8	0·5	.	.	.	1·5	2·	.
18	1·	0·5	6·8	1·2	3·6	.	2·	.	.	8·	.
19	.	4·8	.	1·5	2·	.	0·5	.	.	.	.
20	.	0·5	.	2·1	0·5	.	3·	.	.	2·	.
21	.	.	0·5	1·5	3·6	.	0·5	.	.	9·5	.
22	.	1·	3·7	1·8	6·6	.	.	.	0·5	4·5	.
23	.	2·9	2·1	0·6	4·1	.	.	.	3·	0·5	.
23~24	0·5	1·	1·1	0·6	1·	.	1·5	.	3·5	0·5	.
Total	20·4	39·6	52·0	37·1	100·6	.	23·7	.	142·5	205·8	.
18~9	24·2	27·1	36·4	28·2	65·1	.	22·1	.	116·5	107·8	.

Table B.4.21 Hourly Rainfall (21) Aug. 3, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — Aug. 3 — 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Mallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Capan	Ipo Junction	Sabang	Aparlit	
0~1	.	0·5	2·5	.	0·5	.	.	.	.	0·5	.
2	.	1·	1·	.	1·5	.	.	.	.	1·5	.
3	.	0·5	0·5	0·5	0·5	.	1·	.	.	1·	.
4	.	0·5	0·5	0·5	2·5	.	1·	.	.	1·	.
5	.	.	1·	.	1·	.	5·1	.	.	1·	.
6	.	1·	.	.	0·5	.	6·6	.	.	.	.
7	.	.	.	0·5	0·5	.	3·6	.	.	0·5	.
8	.	.	.	.	0·5	.	1·	.	.	0·5	.
9	.	.	.	.	.	.	1·5	.	8·5	.	.
10	.	.	.	.	0·5	.	0·5	.	8·5	.	.
11	.	.	.	.	.	.	2·6	.	3·5	.	.
12	.	.	1·1	.	.	.	1·	.	7·5	1·	.
13	.	.	2·6	0·5	.	.	.	.	4·5	6·	.
14	.	1·	1·1	3·	5·5	.	.	.	14·5	9·	.
15	.	1·	1·6	0·5	4·	.	5·6	.	5·5	5·5	.
16	.	0·5	0·5	1·5	3·	.	3·6	.	7·5	9·5	.
17	0·5	0·5	2·1	1·5	2·	.	3·6	.	10·	10·	.
18	0·5	1·	2·1	2·	3·	.	.	.	11·	12·	.
19	.	2·4	1·1	1·5	5·5	.	1·5	.	5·	6·	.
20	.	1·	.	.	5·	.	5·6	.	2·	3·	.
21	.	0·5	.	.	2·5	.	1·5	.	5·	3·	.
22	.	.	.	.	0·5	.	.	.	8·5	0·5	.
23	.	0·5	0·5	.	.	.	.	.	5·	2·5	.
23~24	.	.	1·1	1·	0·5	.	1·	.	2·5	4·	.
Total	1·0	11·9	19·3	13·0	39·5	.	46·3	.	109·0	98·0	.
18~8	4·7	25·2	33·6	30·6	69·0	.	35·7	.	143·0	70·0	.

Table B.4.24 Daily Rainfall (1) June 1972

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — June 1972

No.	10	11	12	14	15	16	18	19	21	23	24	25	26
Day \ Gaging Station	Pantabangan Dam	PRIS Dam Tayabo	Cabanatuan San Jose City	Tondod San Jose City	PRIS Dam	Baloc Sto. Domingo	Sibul Talavera	Pinahan Gen. Natividad	Murcon Dam Talavera	Bantug Talavera	Quezon	Famaldan Cinco-Cinco	Cabanatuan City
1	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.	.	.
21	.	0.5	3.8	0.3	0.3	.	0.3	.	0.3	–	2.0	18.3	–
22	.	.	.	.	.	.	0.3	.	2.5	.	.	.	.
23	.	.	.	.	.	0.5	11.4	.	0.8	–	.	.	3.3
24	2.5	5.6	22.1	47.8	2.8	39.4	23.6	.	7.6	10.7	57.2	11.9	9.7
25	26.4	22.6	11.7	11.7	9.9	27.6	29.0	.	22.6	21.3	26.7	26.5	28.7
26	1.5	0.8	.	.	2.8	.	.	.	.	–	.	.	.
27	0.5	8.4	40.1	45.0	0.3	23.4	11.7	.	4.8	19.0	5.8	5.6	15.2
28	26.9	50.8	20.8	9.6	10.4	15.2	21.6	.	5.8	20.8	11.7	4.0	6.6
29	1.5	–	.	.	.	.	–	.	0.3	1.8	3.6	14.0	20.3
30	2.3	3.1	2.8	3.6	–	2.3	3.6	.	2.8	1.3	0.8	1.5	2.5
31	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	61.6	91.8	101.3	118.0	26.5	108.2	101.5		47.5	74.9	107.8	81.8	82.3

Table B.4.23 Hourly Rainfall (23) Aug. 5, 1972

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — Aug. 5 1972

No.	22	33	32	28	39	31	35	52	47	48	
Time \ Gaging Station	PRIS Dam	Hallorca	Lambakin	Zaragoza	San Agustin	San Miguel	Gapan	Ipo Junction	Sabang	Aptlit	
0 ~ 1	1.5	.	.	1.8	0.5	.	6.1	.	1.	.	.
2	.	.	0.5	1.2	.	.	.	.	0.5	.	.
3	1.5	.	.	1.2	0.5	.	.	.	.	.	.
4	0.5	.	.	1.8	.	.	.	.	1.5	.	.
5	.	0.5	0.5	0.6	.	.	.	.	.	.	.
6	0.5	.	.	.	0.5	.	.	.	0.5	.	.
7	1.5	.	3.2	1.8	.	.	.	.	.	.	.
8	2.	3.8	.	1.8	.	.	.	.	4.5	.	.
9	0.5	.	1.	.	.	.	.	.	.	.	.
10	.	.	1.5	0.8	.	.	2.	.	.	.	.
11	2.5	0.5	1.5	2.3	0.5	.	.	.	.	.	.
12	1.	5.3	.	1.9	1.5	.	0.5	.	.	3.5	.
13	1.5	0.5	3.2	1.6	6.9	.	.	.	↓	.	.
14	6.9	1.9	9.5	4.3	11.8	.	.	.	>	6.	.
15	6.9	6.7	3.1	1.9	8.8	.	.	.	—	13.5	.
16	1.	4.3	3.6	3.9	11.3	.	.	.	↓	18.	.
17	1.	3.8	0.5	5.5	3.9	.	.	.	↓	3.5	.
18	.	1.	.	0.4	0.5	.	.	.	left	0.5	.
19	.	0.5	0.5	.	0.5	.	.	.	—	.	.
20	.	.	.	.	0.5	.	.	.	.	.	.
21	.	.	0.5	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	↓	.	.
23 ~ 24	.	.	.	0.4	0.5	.	.	.	↓	.	.
Total	26.8	28.8	29.1	33.2	48.2	.	8.6	.	.	45.0	.
18 ~ 9	.	.	.	.	.	.	.	.	.	.	.

Table B.4.26 Daily Rainfall (3) July 1972

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — July 1972

No.	10	11	12	14	15	16	18	19	21	23	24	25	26
Day \ Gaug Station	Tanihangan Dam	TRIS Dam Tayabin	Tomacaracan San Jose City	Tondod San Jose City	PRIS Dam	Baloc Sto. Domingo	Sibul Talavera	Pinahan Gen. Natividad	Muñoz Dam Talavera	Bantug Talavera	Quezon	Pamaldan Cinco-Cinco	Cabanatuan City
1	.	-.	-.	5.1	-.	0.3	5.3	-.	0.3	0.3	.	9.2	5.8
2	.	24.2	44.2	10.4	14.9	19.1	36.1	44.2	106.5	38.4	35.6	4.1	7.1
3	10.9	11.2	30.7	51.3	13.2	3.6	8.9	1.5	0.5	4.8	2.5	0.8	.
4	.	1.5	5.1	.	.	.	.	.	4.1	-.	.	.	.
5	.	.	-.	0.3	.	2.0	1.0	.	0.5	-.	1.3	.	.
6	106.9	101.1	99.1	143.8	118.9	137.9	146.0	146.4	156.7	147.6	158.2	200.9	224.2
7	107.9	105.9	80.0	66.6	131.8	98.8	111.8	130.6	131.5	99.2	112.0	166.1	112.8
8	28.8	26.7	18.3	26.7	25.2	25.9	26.9	35.4	19.0	18.8	23.6	18.3	13.2
9	79.3	78.7	52.1	63.5	54.9	59.7	53.3	65.5	45.9	27.1	58.4	37.8	80.7
10	65.8	78.7	50.0	48.0	60.8	40.7	61.2	115.3	53.8	60.7	46.8	62.0	68.5
11	87.3	33.8	16.0	20.1	26.7	12.5	18.5	11.1	10.2	5.6	9.1	12.2	8.7
12	87.4	20.3	26.2	43.2	6.3	9.2	3.5	12.5	6.8	3.3	2.5	3.8	6.6
13	10.7	42.1	10.9	3.6	5.3	2.3	3.0	2.3	2.8	2.6	7.4	4.3	5.4
14	52.0	46.5	32.5	22.1	23.4	10.7	11.4	14.2	15.5	12.5	13.5	18.6	9.1
15	17.0	58.2	6.1	.	-.	.	1.0	-.	1.0	0.8	6.4	0.3	5.8
16	44.5	38.1	2.0	12.7	14.2	6.9	4.6	10.7	2.5	1.3	3.3	12.2	1.3
17	104.4	118.6	84.6	76.9	82.8	68.4	68.1	56.6	53.1	58.1	71.2	52.1	48.1
18	57.9	78.3	83.8	66.3	55.1	78.0	76.2	114.0	55.6	61.8	71.1	84.0	73.3
19	27.7	36.6	38.4	42.7	35.1	56.6	53.1	45.7	51.8	57.9	51.8	53.6	54.6
20	19.9	23.7	22.1	27.4	17.5	32.8	29.0	28.6	23.4	29.2	40.7	22.9	20.9
21	7.1	11.5	2.4	14.5	6.9	20.8	17.3	10.9	14.0	13.0	15.0	14.0	12.0
22	20.3	3.6	7.4	6.6	48.8	1.5	4.1	-.	10.2	5.3	2.5	-.	.
23	22.9	2.3	4.3	6.6	28.2	35.1	39.4	18.0	3.0	1.8	-.	2.0	2.9
24	50.0	1.8	28.5	5.9	21.9	2.0	1.0	-.	2.0	1.6	0.5	11.0	10.6
25	12.4	69.3	6.9	13.4	8.9	14.4	12.2	6.9	5.6	6.1	15.8	10.4	5.5
26	7.9	28.1	6.6	11.4	11.0	18.3	11.2	12.9	10.9	11.7	15.3	8.6	9.1
27	44.5	61.4	33.8	44.7	51.5	61.7	59.1	46.5	58.1	76.9	89.3	70.2	67.8
28	90.9	108.7	83.1	72.7	72.9	83.3	90.2	100.6	100.3	90.9	105.1	122.5	104.4
29	32.0	46.0	38.0	37.1	37.1	44.9	51.1	76.9	71.1	85.8	87.4	61.5	47.0
30	26.9	23.4	30.7	26.9	21.1	22.9	28.7	32.3	35.3	41.6	41.9	59.2	48.0
31	39.9	38.6	29.5	29.2	34.8	37.5	43.9	36.1	54.8	55.1	43.7	47.5	51.3
Total	1225.2	1289.4	975.3	999.7	1035.2	1017.8	1072.1	1119.7	1106.8	1021.8	1131.9	1170.1	1064.7

Table B.4.25 Daily Rainfall (2) June 1972

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — June 1972

No.	27	28	29	31	32	33	35	39	40	43	47	48	51
Day \ Gaug Station	Bongad Cabanatuan	Zaragoza	Gabaldon	San Miguel Ila, Lulipita	Lambakin Jaen	Mallorca San Leonardo	Capas	San Agustin Arayat	San Miguel Bulacan	Sta. Cruz Porac	Sabana Railway	Apalit	San Lorenzo Nuruguey
1	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.	.	.
21	0.5	2.1	2.0	2.0	1.5	5.1	.	-.	.	4.3	1.0	5.6	8.9
22	.	.	0.5	18.3	0.5	.	.	9.7	6.8	47.2	8.3	1.0	.
23	1.0	.	.	.	.	-.	.	4.8	.	9.1	.	.	.
24	7.4	25.4	25.7	43.4	17.0	8.6	10.9	9.4	22.9	17.3	28.2	8.1	13.2
25	18.6	24.1	48.6	33.3	21.6	8.6	22.9	28.2	25.6	38.1	86.8	54.6	26.9
26	.	.	2.3	0.8	0.5	2.3	1.0	4.6	2.5	8.9	5.8	1.5	.
27	16.3	2.1	1.3	7.6	14.7	2.5	1.0	.	.	0.5	1.5	0.5	22.7
28	37.6	3.8	45.0	1.8	0.5	-.	-.	.	38.1	.	7.1	.	.
29	9.6	5.1	16.0	0.8	0.5	-.	.	3.6	4.6	-.	19.8	3.0	34.8
30	3.5	.	3.1	1.3	3.3	3.6	0.8	7.9	4.3	2.0	12.2	.	29.5
31	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	89.5	62.6	144.5	109.3	60.1	30.7	36.6	68.2	102.6	177.4	160.7	74.3	134.0

Table B.4.28 Daily Rainfall (5) Aug. 1972

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — Aug. 1972

No.	10	11	12	14	15	16	18	19	21	23	24	25	26
Day \ Gage Station	Pantabangan Dam	TRIS Dam Tayabo	Cabanatuan San Jose City	Tondod San Jose City	PRIS Dam	Baloc Sto. Domingo	Sibul Talavera	Pinahan Gen. Natividad	Murcon Dam Talavera	Bantug Talavera	Quezon	Pamaldan Cinco-Cinco	Cabanatuan City
1	17.0	14.7	14.0	17.5	14.2	35.1	27.2	17.8	28.7	30.2	43.9	31.0	28.4
2	7.9	10.4	8.6	9.4	6.6	15.3	12.2	7.4	13.8	21.4	28.2	28.0	23.3
3	35.5	8.1	16.3	3.1	4.8	10.4	4.3	5.1	7.9	17.0	23.1	15.0	16.3
4	18.8	32.0	20.8	40.1	23.9	19.9	12.4	11.1	13.7	18.5	19.0	25.4	26.7
5	26.4	26.5	23.8	26.7	21.1	26.9	23.9	16.8	18.8	20.6	31.0	27.9	30.8
6	4.3	4.1	1.3	2.6	33.5	7.7	15.5	5.8	9.4	2.8	6.3	1.3	3.3
7	5.3	6.9	19.1	8.1	8.9	3.0	12.0	0.2	.	.	T.	.	.
8	.	.	.	22.9	0.3	1.8	0.3	.	.	.	2.3	.	.
9	1.0	1.5	T.	.	.	.	.	.	.	.	T.	.	.
10	.	.	—	.	.	0.3	8.7	0.3	25.9	4.8	3.0	2.0	7.6
11	.	13.5	.	.	2.0	.	.	.	1.5	T.	.	52.8	17.6
12	16.5	15.0	18.6	39.1	31.5	10.2	2.8	.	5.1	21.1	3.3	4.3	2.8
13	12.0	6.6	4.6	12.2	10.7	57.1	58.1	10.2	41.4	38.2	47.8	62.2	38.3
14	6.3	18.8	32.5	6.46	8.9	3.8	6.3	5.4	2.3	4.6	.	1.8	1.8
15	42.7	45.3	43.2	57.4	51.8	44.5	38.4	69.8	24.4	23.9	20.3	26.4	35.0
16	44.9	57.2	26.4	34.8	11.3	45.7	50.1	67.6	43.7	46.2	56.4	60.4	82.9
17	45.5	67.0	44.5	37.2	23.2	35.0	33.8	23.1	23.2	21.6	29.0	30.2	38.1
18	5.8	5.6	7.9	6.1	1.3	10.4	8.1	T.	3.1	12.5	13.7	2.0	3.0
19	.	.	.	.	.	.	.	.	.	.	.	.	.
20	11.4	16.5	50.0	90.2	0.3	3.1	29.1	34.3	36.6	10.7	2.3	24.6	30.2
21	17.5	16.8	22.9	18.8	33.8	18.3	20.9	12.7	13.5	44.5	68.1	60.2	39.1
22	18.5	23.1	24.4	58.6	25.4	72.9	82.2	42.7	24.8	57.9	24.1	18.5	11.4
23	10.4	22.7	27.9	2.6	6.9	3.1	2.5	21.6	14.0	3.3	17.1	4.6	21.9
24	7.6	15.5	15.5	15.5	13.5	5.6	3.5	12.2	9.2	4.4	5.1	3.3	1.1
25	14.0	14.3	16.3	22.1	6.1	9.9	5.8	9.9	3.3	11.0	26.1	1.5	4.6
26	14.0	11.9	15.8	48.5	5.6	15.0	14.2	1.8	2.3	13.2	11.9	5.3	1.5
27	.	.	—	.	.	.	.	.	.	.	.	.	.
28	2.5	1.3	0.8	1.6	1.8	1.1	0.8	0.5	0.3	0.8	.	.	T.
29	.	—.	—.	.	.	.	T.	T.	—.	—.	.	.	—.
30	5.8	5.4	8.4	16.5	8.9	7.6	10.2	—.	9.9	8.6	4.6	4.6	7.6
31	7.9	4.6	3.8	5.4	7.6	5.1	3.8	4.1	4.1	5.8	9.1	7.3	7.6
Tot.	397.0	405.3	467.4	553.7	363.9	442.8	445.1	380.5	436.9	487.6	495.7	430.1	638.8

Table B.4.27 Daily Rainfall (4) July 1972

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — July 1972

No.	27	28	29	31	32	33	35	39	40	43	47	48	51
Day \ Gage Station	Rangad Cabanatuan	Zaragoza	Gabaldon	San Miguel Ha. Julieta	Lambakin Jaen	Mallorca San Leonardo	Gapan	San Agustin Arayat	San Miguel Bulacan	Sta. Cruz Porac	Sabang Baliwag	Apalit	San Lorenzo Nueipany
1	T.	.	2.0	1.1	16.0	12.5	5.1	0.3	3.8	.	.	.	.
2	—.	23.4	0.8	36.1	69.9	22.4	48.3	31.0	5.1	.	2.8	21.6	.
3	1.5	43.7	8.4	0.8	14.5	17.5	1.0	7.1	2.5	1.0	11.9	7.6	5.9
4	.	2.5	T.	0.3	.	1.0	.	.	.	1.0	2.0	.	9.4
5	T.	1.3	2.3	.	.	T.	0.5	0.5	.	11.4	19.8	1.5	13.0
6	268.2	118.1	157.5	99.6	123.9	178.5	167.6	99.4	19.6	41.9	185.6	134.5	51.8
7	123.4	201.7	114.0	110.0	138.2	116.1	161.6	196.8	96.5	186.2	161.5	76.2	52.1
8	62.8	221.8	33.5	28.9	19.6	15.0	16.2	31.8	109.2	65.3	28.2	17.5	19.1
9	47.3	142.5	24.3	32.6	36.8	25.7	33.0	52.6	94.7	69.9	36.3	32.3	27.7
10	45.6	173.6	52.9	48.2	76.9	48.2	39.7	40.4	64.5	130.1	25.7	28.5	8.1
11	10.7	13.7	55.6	23.3	16.5	12.2	17.8	20.1	17.3	30.8	34.5	47.3	8.9
12	3.8	2.0	19.1	8.1	3.0	3.3	5.9	12.7	20.3	3.5	32.3	26.5	7.9
13	4.3	2.8	41.2	16.8	3.3	5.1	5.1	12.4	29.7	31.8	26.6	16.8	6.6
14	8.1	12.2	25.6	19.1	10.9	10.4	.	25.7	14.0	56.4	9.4	9.1	5.6
15	3.1	.	11.2	8.1	14.5	10.4	0.8	1.8	10.9	0.5	0.5	2.0	1.8
16	8.9	.	68.8	17.3	7.1	12.5	18.3	4.3	59.7	43.4	0.5	2.0	1.3
17	41.4	73.7	13.8	115.3	60.0	44.9	58.9	100.8	82.6	188.5	114.0	206.2	52.6
18	69.1	114.2	42.4	171.7	141.3	105.7	139.2	149.4	76.0	271.8	170.4	280.4	79.2
19	55.4	61.0	25.1	118.8	58.7	74.9	97.8	118.1	69.8	182.2	138.4	166.3	60.7
20	28.9	25.4	8.9	70.3	35.1	17.3	34.6	107.2	22.9	244.3	108.5	162.1	72.6
21	9.7	.	2.0	21.1	17.0	10.9	12.2	10.9	22.8	41.9	16.7	16.6	16.0
22	—.	.	6.8	1.6	8.1	8.4	9.1	4.1	.	6.6	2.0	1.5	18.0
23	2.0	.	15.2	18.0	6.1	6.4	7.4	31.2	14.0	73.6	40.4	94.3	13.7
24	9.9	15.3	8.1	4.8	6.3	6.6	4.8	1.5	.	4.6	10.5	14.2	15.2
25	5.1	10.2	14.0	17.5	9.7	5.3	8.9	16.5	.	47.5	9.2	13.2	17.8
26	14.0	14.8	58.9	32.0	19.5	24.6	16.3	21.6	25.4	51.5	35.5	69.6	30.2
27	70.1	77.5	45.7	107.9	75.9	68.0	66.0	91.0	22.3	114.1	57.2	125.3	49.3
28	96.3	114.5	63.5	182.0	112.8	91.2	117.8	77.2	66.0	94.7	69.3	99.5	38.1
29	49.0	35.6	73.7	70.6	52.8	49.5	101.6	70.4	76.2	117.5	64.3	107.7	28.2
30	47.8	87.7	42.4	100.6	90.0	83.6	78.2	49.3	61.0	73.2	76.9	131.3	3.3
31	42.4	72.4	11.4	97.5	55.4	46.5	55.1	70.9	60.4	70.4	68.9	111.5	.
Tot.	1146.8	1380.2	1042.6	1590.0	1297.8	1125.6	1325.8	1457.0	1142.1	2261.6	1493.8	2202.1	751.1

Table B.4.29 Daily Rainfall (6) Aug. 1972

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga

Aug. 1972

No.	27	28	29	31	32	33	35	39	40	43	47	48	51
Day \ Gauging Station	Bangad Cabanatuan	Zaragoza	Cabaldon	San Miguel Hs. Lumintao	Lambakin Jaen	Hallorca San Leonardo	Capas	San Agustin Arayat	San Miguel Bulacan	Sta. Cruz Porac	Sabang Salitran	Apalit	San Lorenzo Nueragaray
1	19.3	37.6	3.0	11.7	27.7	40.4	22.1	80.8	58.4	121.4	183.0	179.9	26.4
2	18.0	22.1	2.3	32.8	61.6	35.5	23.6	81.0	58.9	125.0	118.3	109.5	34.6
3	12.7	30.5	12.5	0.8	33.5	36.3	24.9	69.6	58.6	93.5	95.5	171.5	61.2
4	21.6	27.9	11.2	20.6	36.8	48.2	26.7	66.3	73.7	103.9	89.7	108.2	54.9
5	29.7	25.2	35.3	30.2	29.7	2.5	25.4	51.5	76.2	61.0	16.3	45.5	26.2
6	12.7	3.1	2.8	2.3	3.8	.	0.5	19.5	12.7	11.5	6.9	7.1	8.9
7	.	0.3	.	.	.	.	.	.	.	.	.	.	12.9
8	.	12.7	.	0.3	8.5	.	.	8.1	.	13.0	.	.	10.7
9	.	.	.	.	16.6	34.0	T.	26.2	50.8	22.1	18.5	1.5	1.8
10	20.3	38.8	14.7	.	27.9	108.7	12.2	2.3	63.5	20.1	11.9	5.1	5.3
11	32.8	16.6	0.5	.	12.7	2.0	5.6	3.1	7.6	.	.	.	0.5
12	3.3	3.6	3.8	.	23.4	68.1	12.7	1.3	12.7	2.0	1.8	.	0.6
13	32.5	33.3	16.1	0.3	32.7	21.3	38.1	12.2	5.1	27.9	3.6	16.1	.
14	T.	T.	10.6	.	3.3	21.8	T.	2.1	12.7	T.	2.0	.	.
15	13.5	36.3	83.4	.	38.1	50.8	23.9	12.7	31.5	9.2	3.1	1.5	.
16	39.9	69.5	16.7	10.2	54.1	56.9	38.3	135.6	55.9	147.6	110.3	119.2	.
17	28.2	25.4	46.2	33.8	61.7	61.9	43.4	72.6	76.2	80.8	36.8	58.2	.
18	1.0	6.8	.	2.3	1.5	.	.	.	.	20.1	.	1.0	3.8
19	.	.	1.0	.	.	.	T.	.	.	.	.	.	.
20	11.7	7.9	4.3	.	3.1	.	0.5	40.4	.	.	11.2	.	3.5
21	21.6	7.6	38.8	.	9.4	6.1	60.6	2.0	.	.	6.1	76.0	.
22	2.5	22.6	1.5	.	.	0.8	T.	.	.	1.0	0.3	.	.
23	19.1	6.1	9.6	1.0	6.8	7.1	2.8	1.3	.	20.6	3.6	3.1	.
24	5.8	11.0	32.3	7.6	18.0	70.4	48.5	22.9	12.7	17.0	28.2	20.6	5.1
25	6.6	6.4	11.2	7.6	3.8	8.1	6.4	10.6	.	20.5	13.5	11.2	1.3
26	3.0	2.5	28.7	0.5	6.9	2.0	1.3	6.9	.	2.0	8.9	1.0	3.1
27	.	.	.	.	.	.	.	.	.	0.5	.	.	6.1
28	.	.	5.3	.	0.3	0.5	2.3	1.8	.	.	0.5	.	.
29	.	.	13.0	.	2.5	2.0	0.3	12.5	.	32.0	11.4	9.6	6.8
30	7.9	5.6	60.7	0.5	18.0	9.6	11.6	17.0	2.5	13.2	35.6	22.2	3.3
31	6.1	10.9	29.5	.	7.1	.	16.3	2.0	.	1.5	2.0	7.1	2.8
Total	369.8	430.3	435.0	163.5	483.5	713.0	426.0	757.3	669.2	947.4	777.0	963.1	247.8

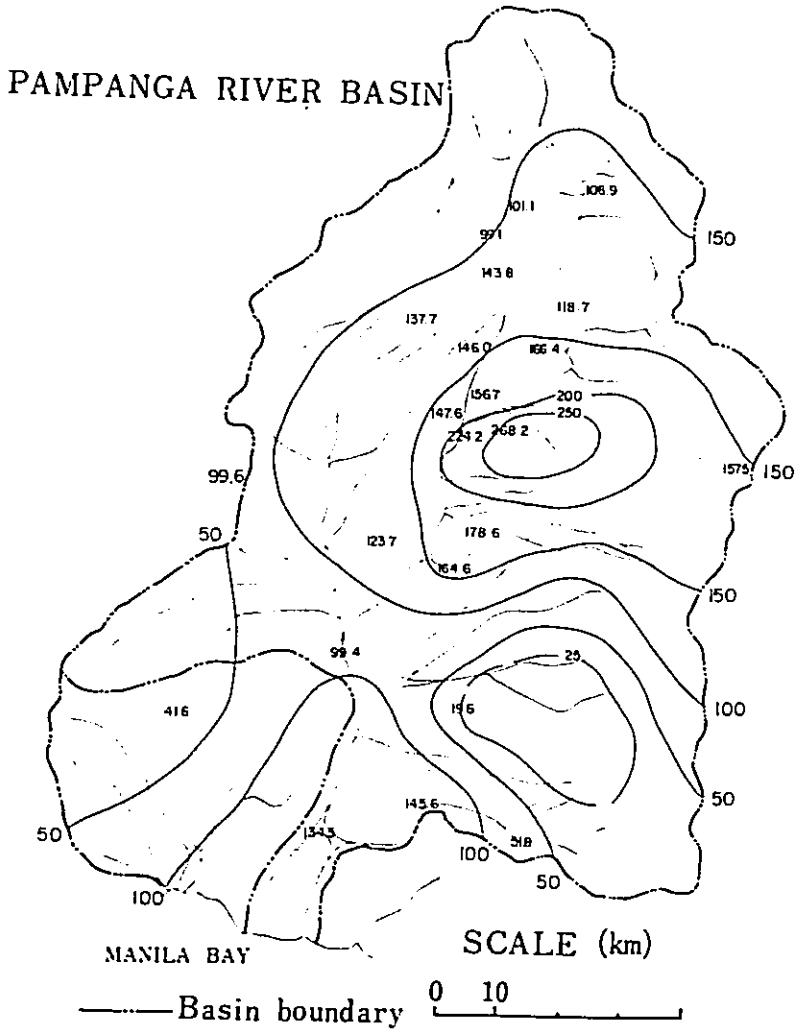


Fig. B.4.3 Isohyetal Map July 6, 1972

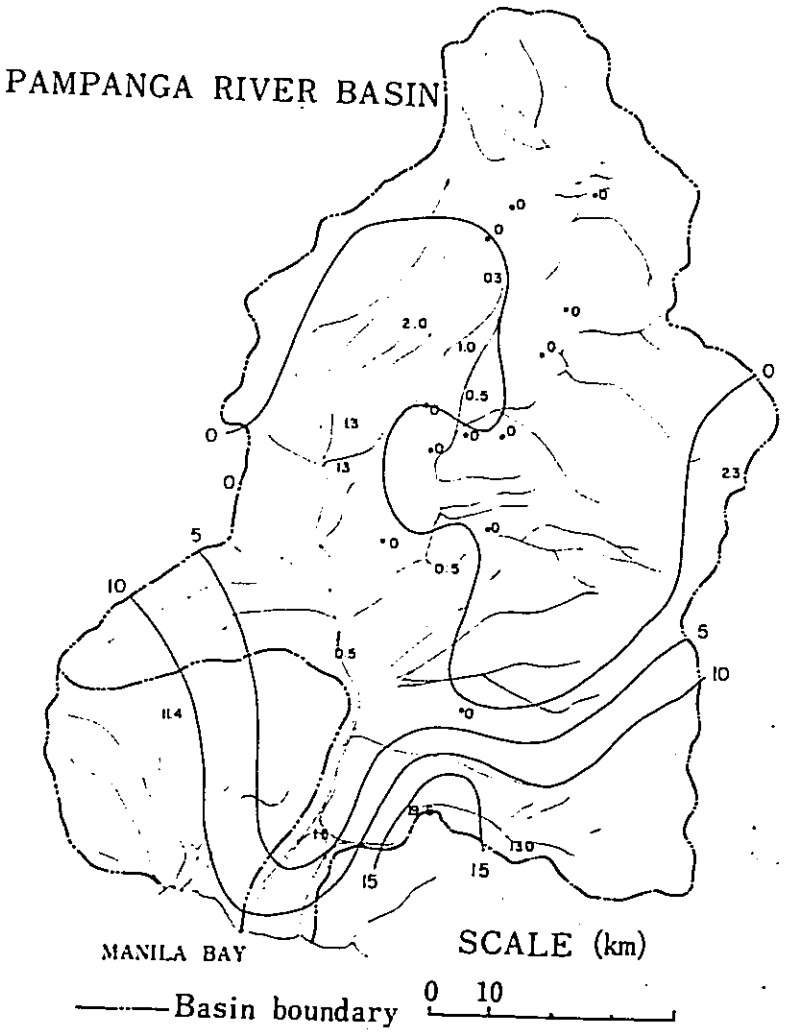


Fig. B.4.2 Isohyetal Map July 5, 1972

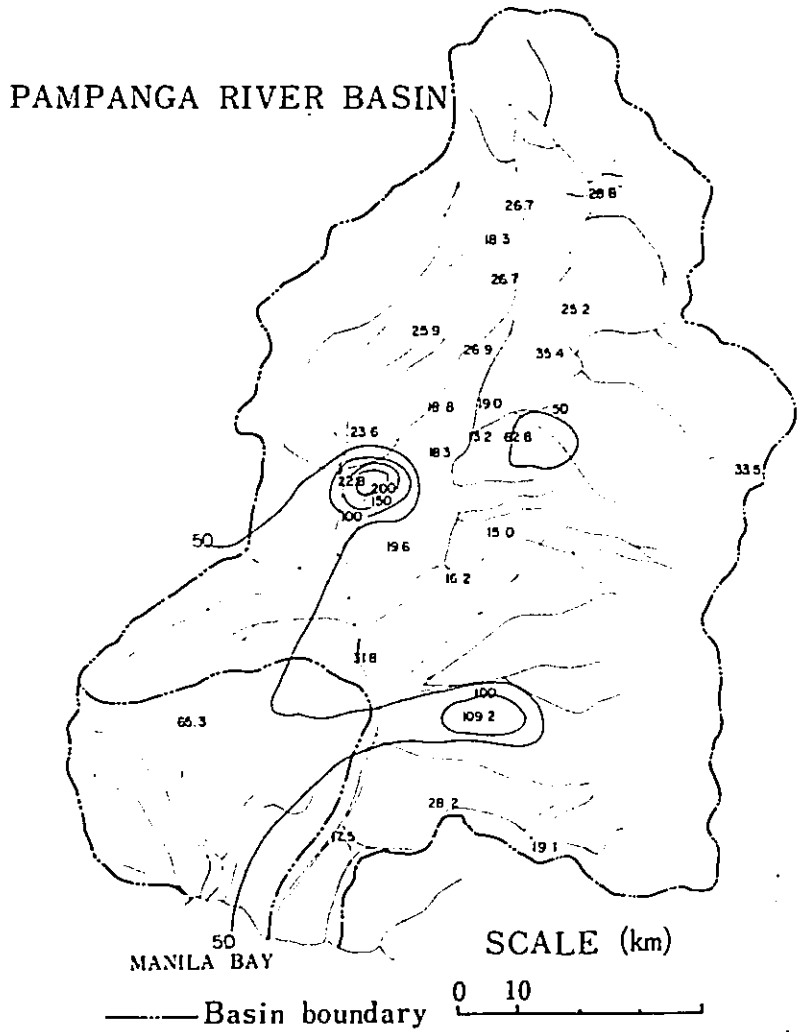


Fig. B.4.5 Isohyetal Map July 8, 1972

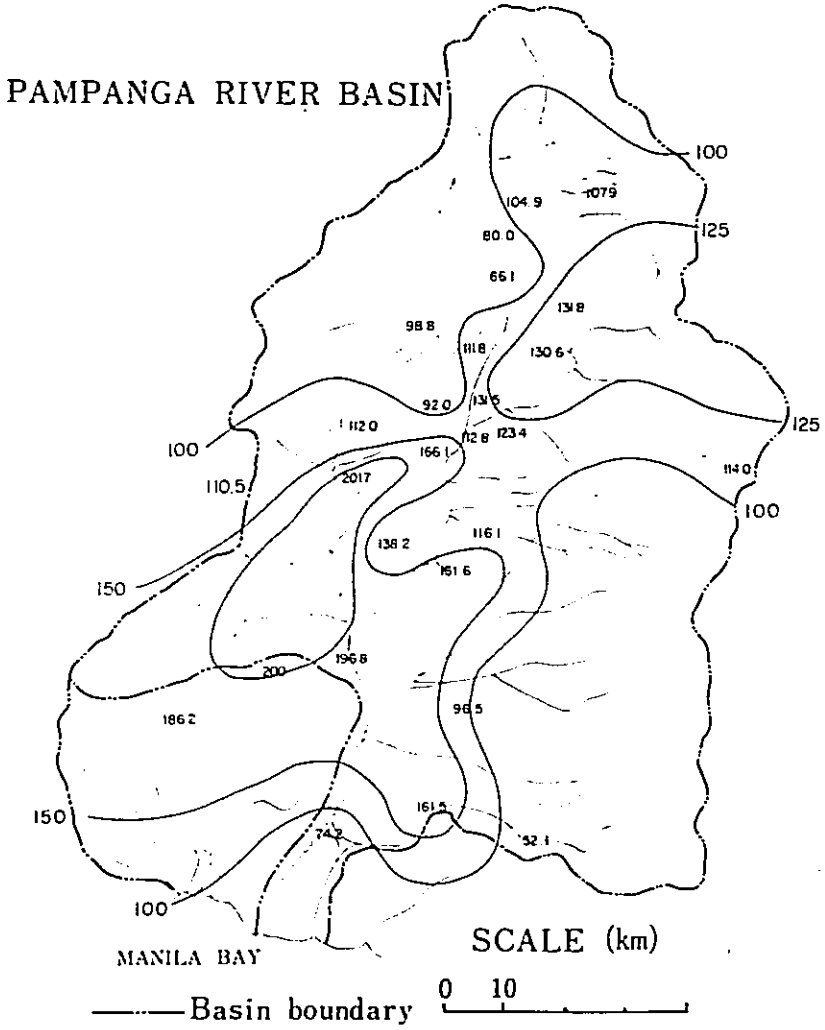


Fig. B.4.4 Isohyetal Map July 7, 1972

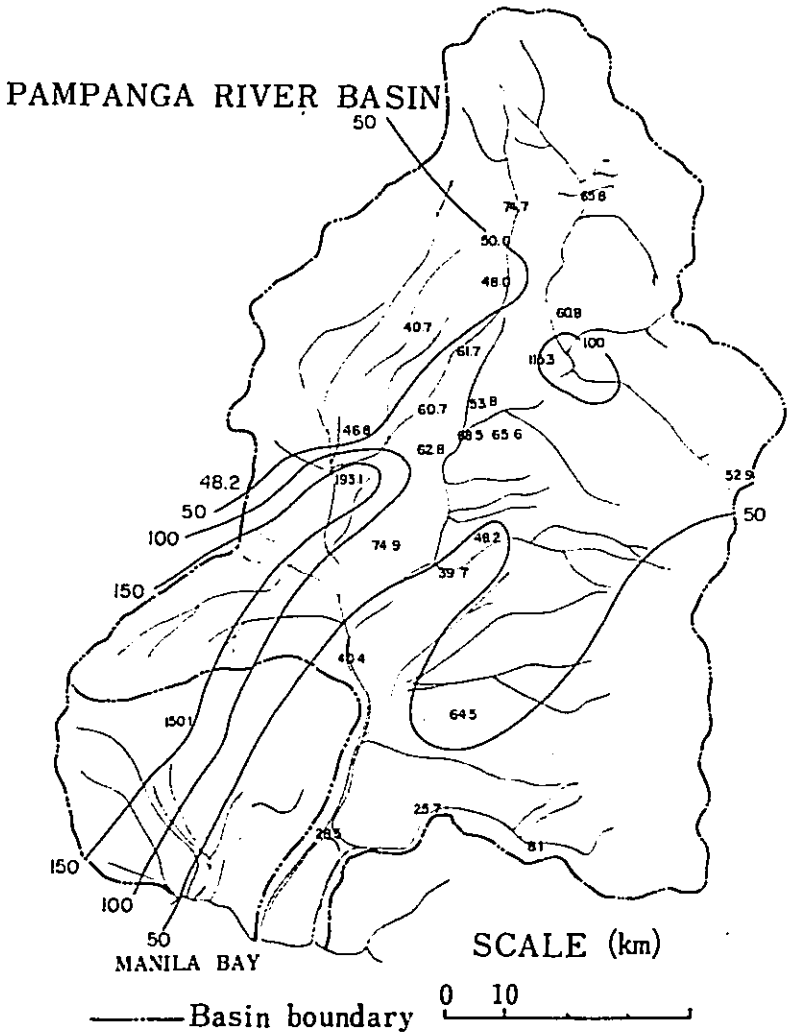


Fig. B.4.7 Isohyetal Map July 10, 1972

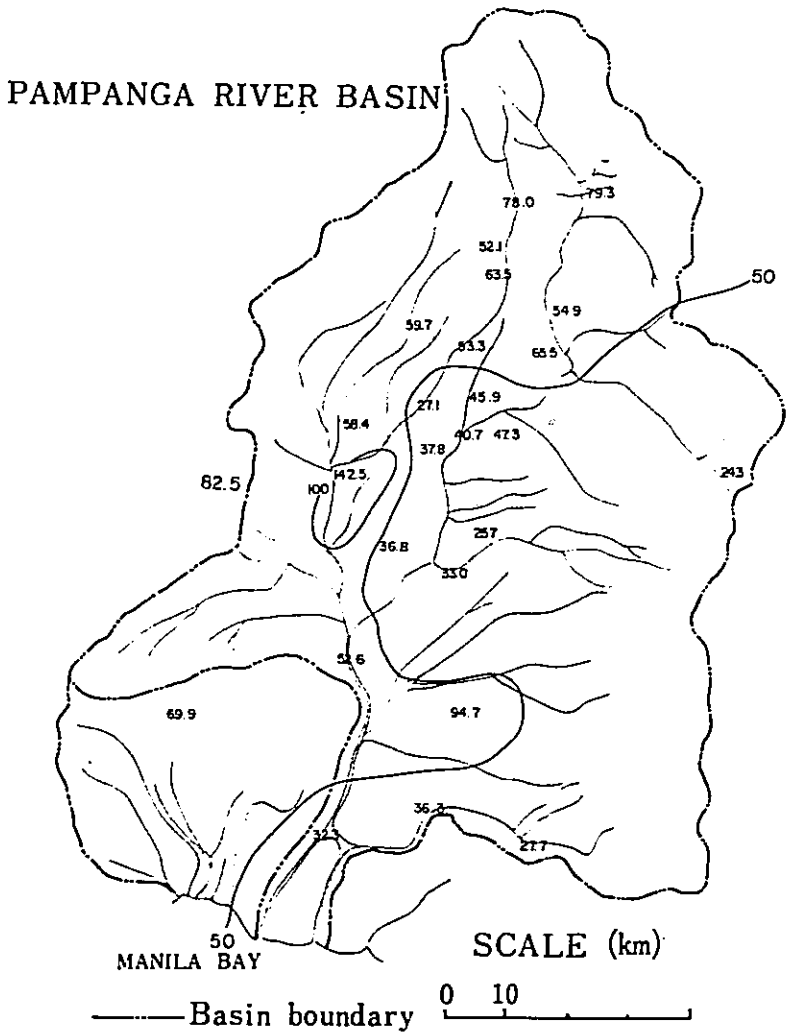


Fig. B.4.6 Isohyetal Map July 9, 1972

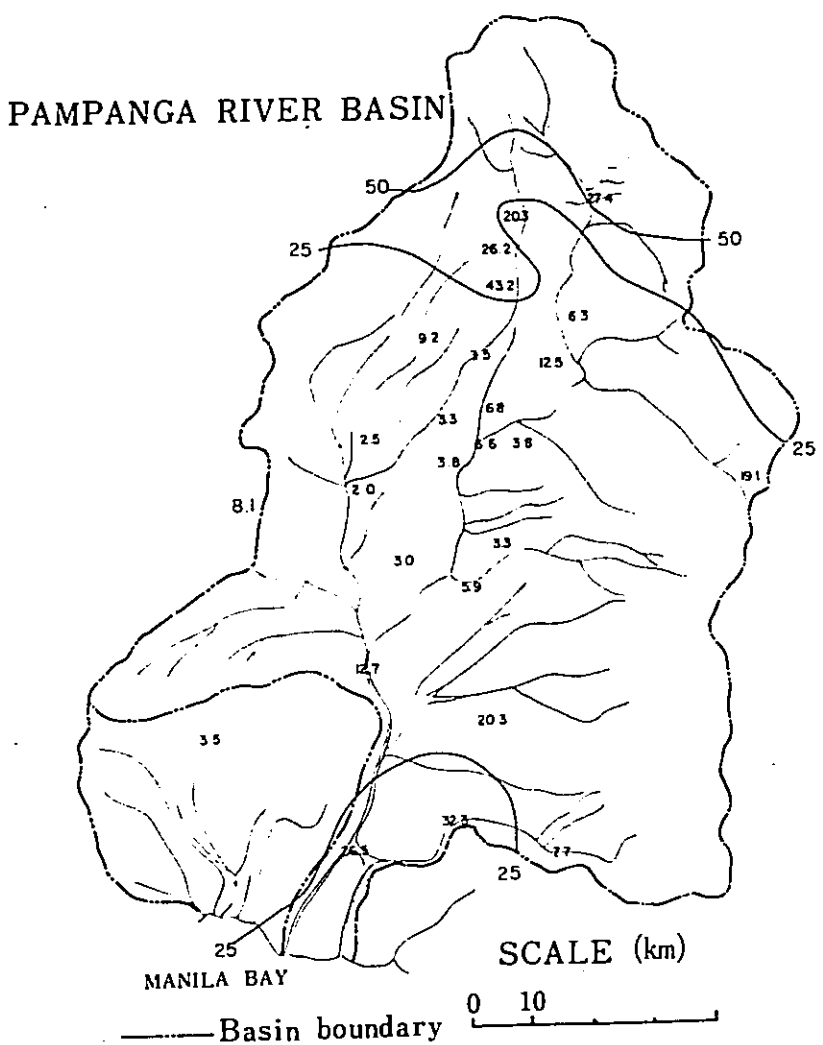


Fig. B.4.9 Isohyetal Map July 12, 1972

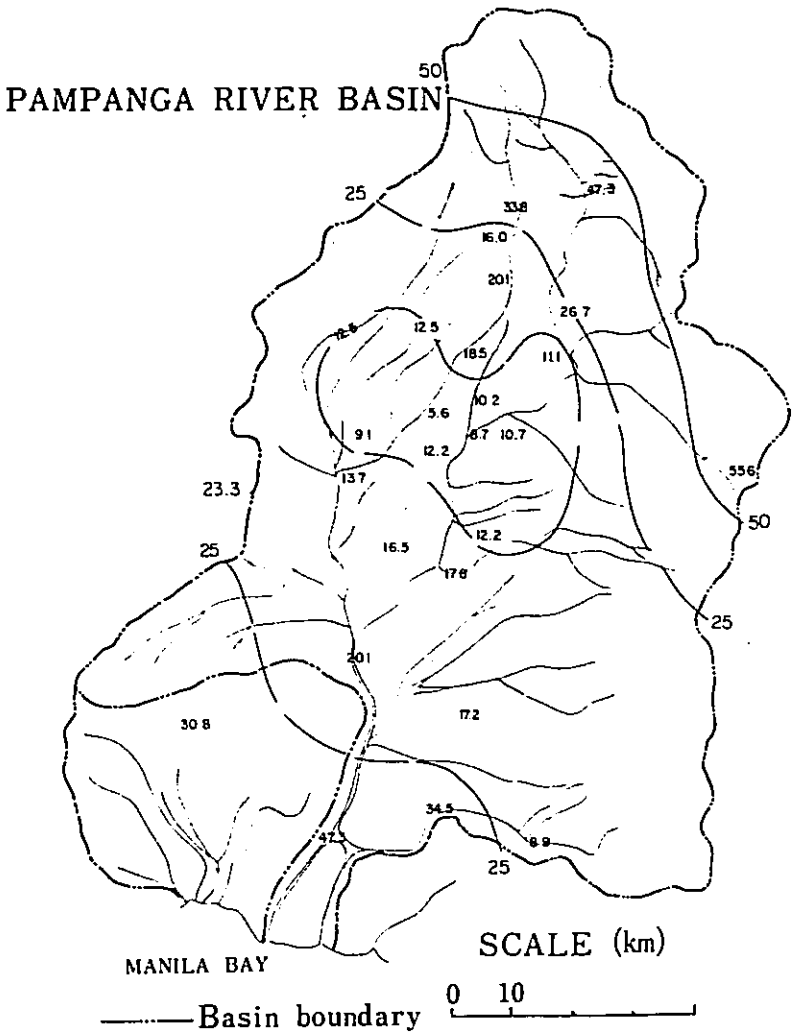


Fig. B.4.8 Isohyetal Map July 11, 1972

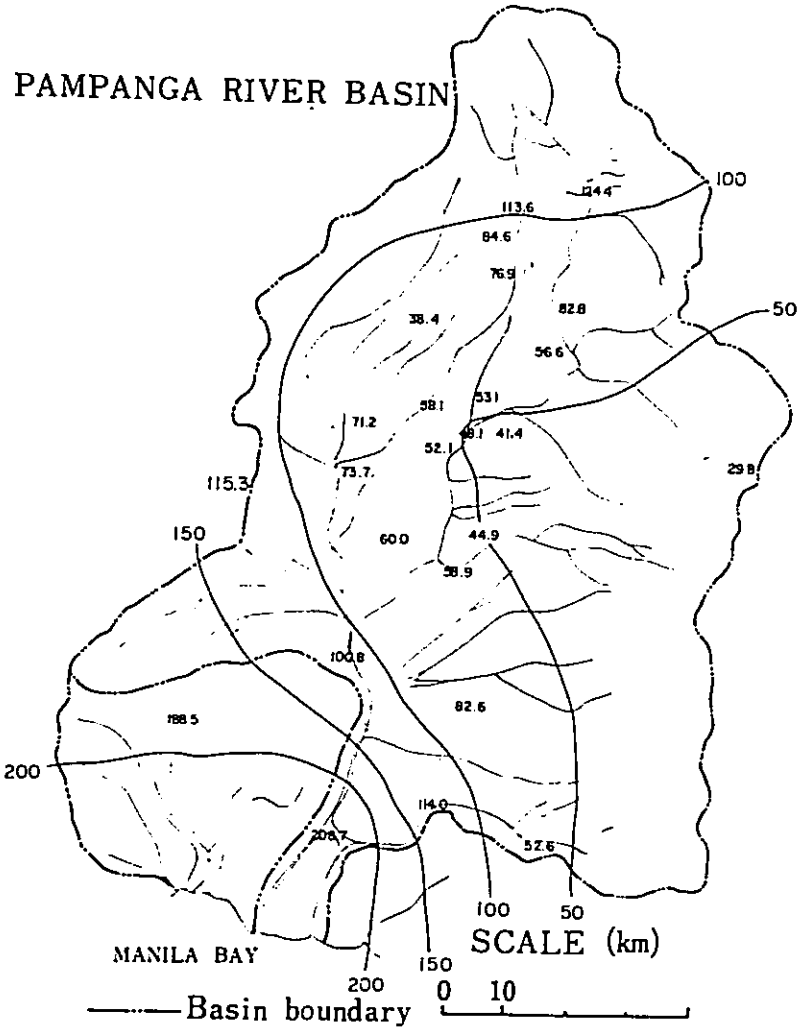


Fig. B.4.11 Isohyetal Map July 17, 1972

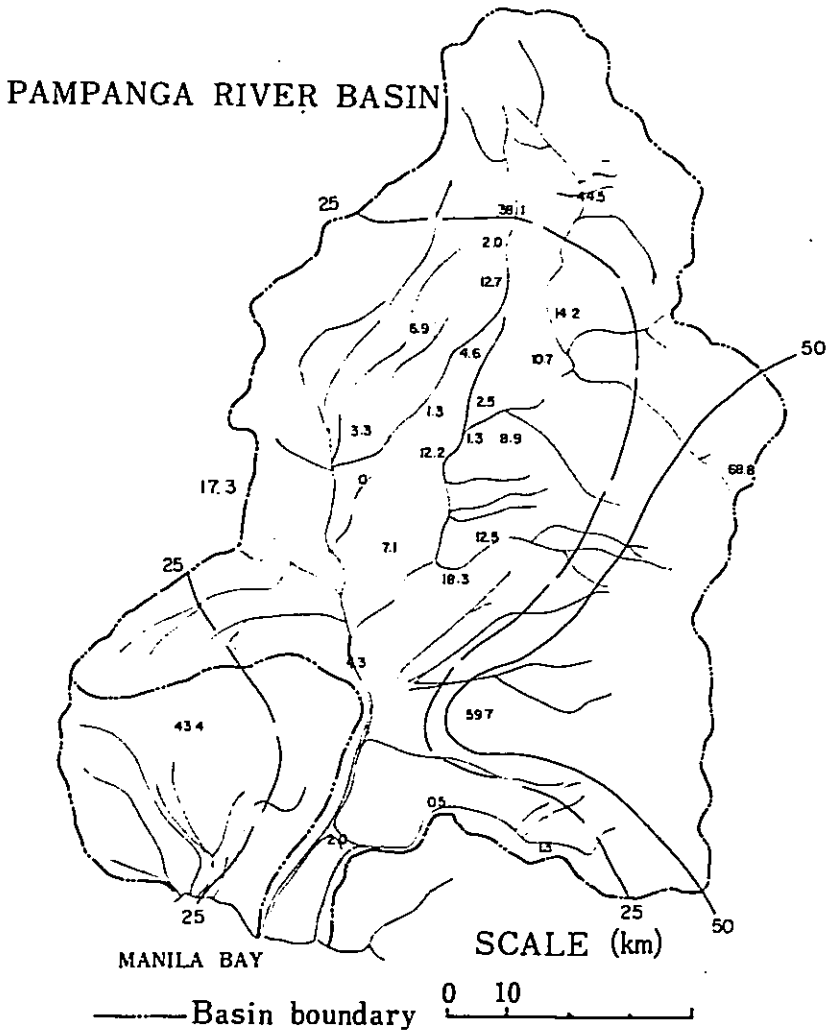


Fig. B.4.10 Isohyetal Map July 16, 1972

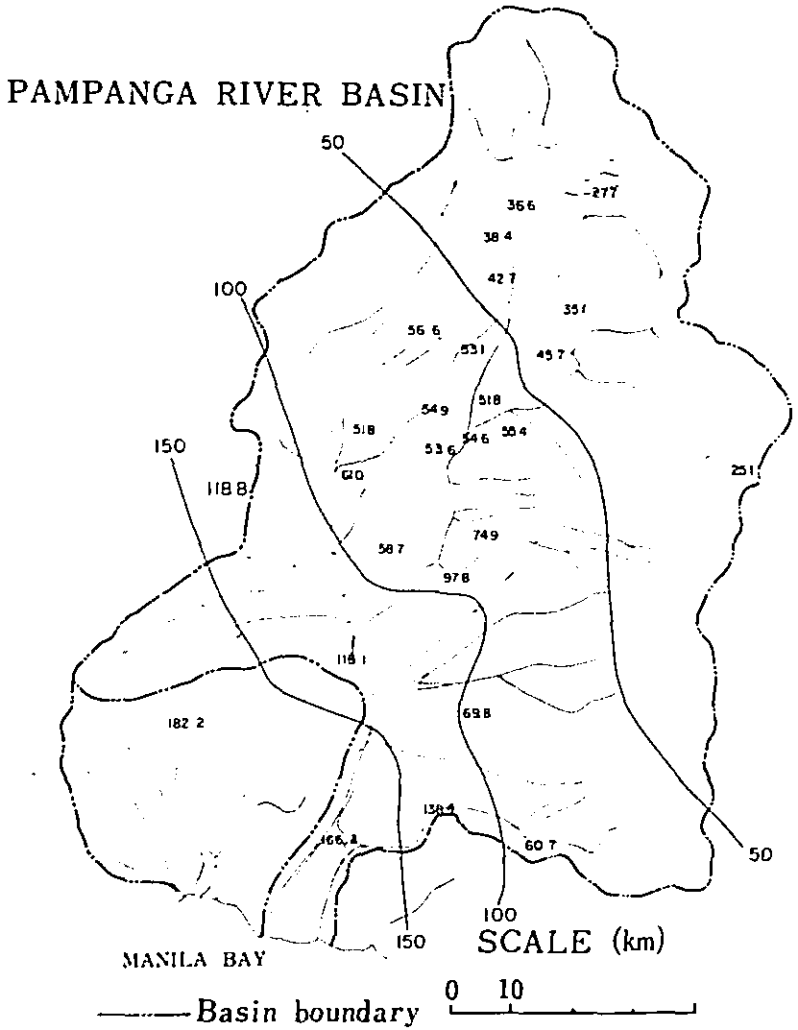


Fig. B.4.13 Isohyetal Map July 19, 1972

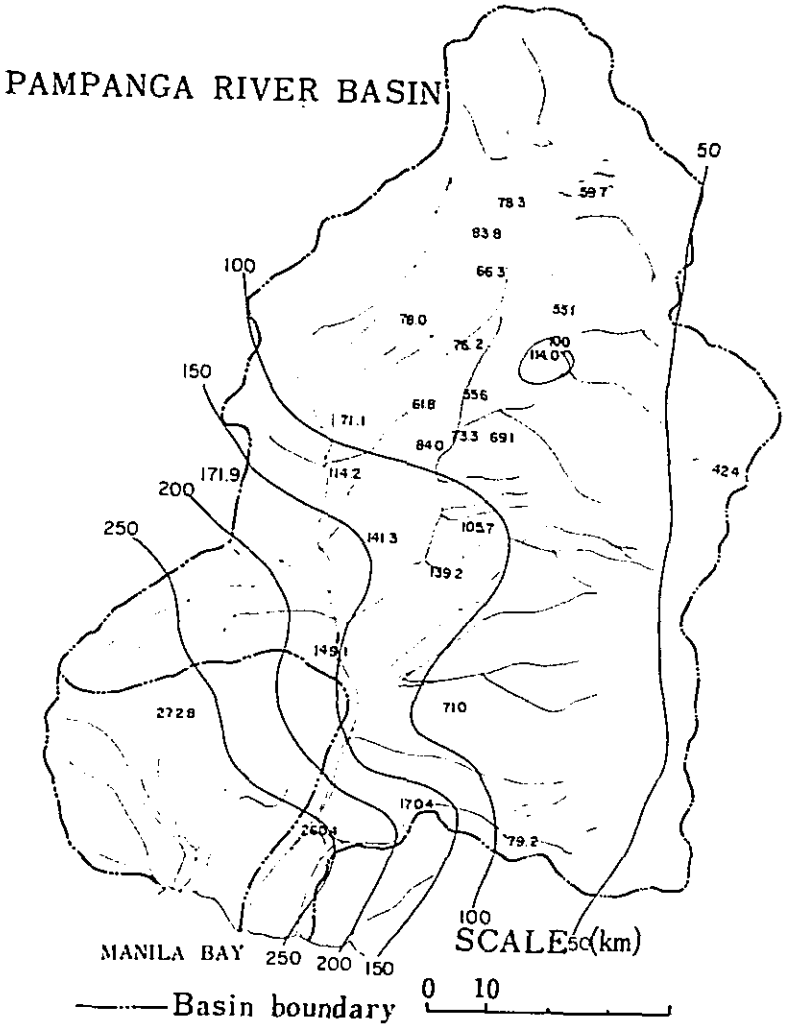


Fig. B.4.12 Isohyetal Map July 18, 1972

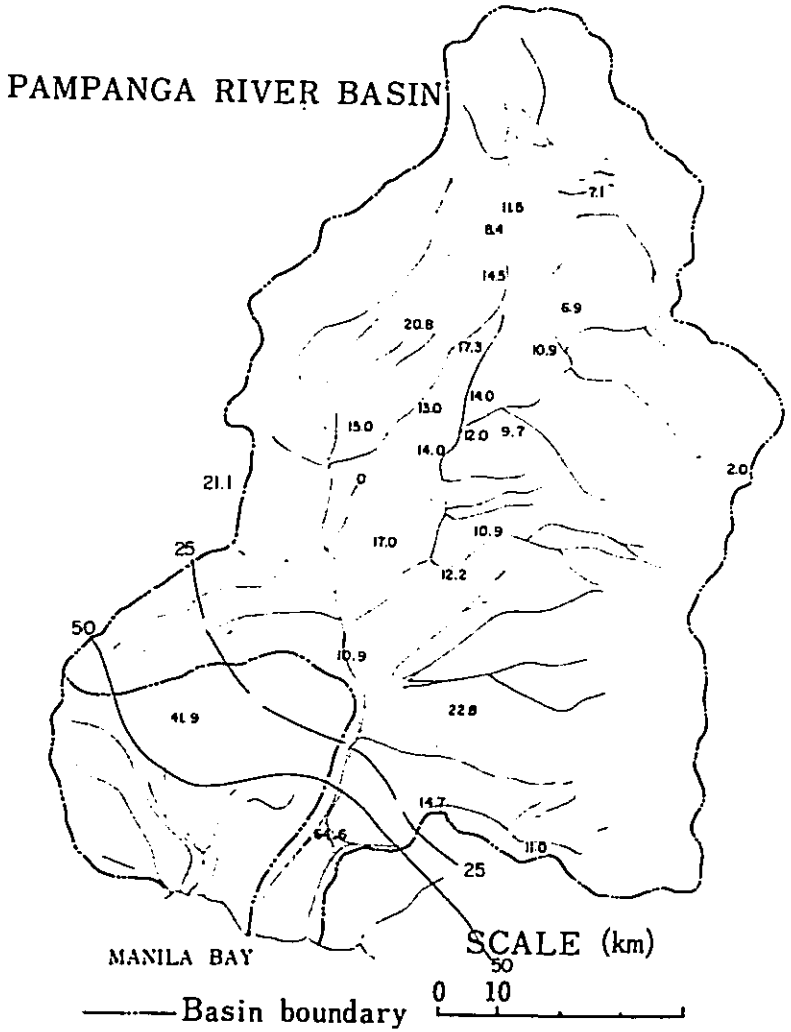


Fig. B.4.15 Isohyetal Map July 21, 1972

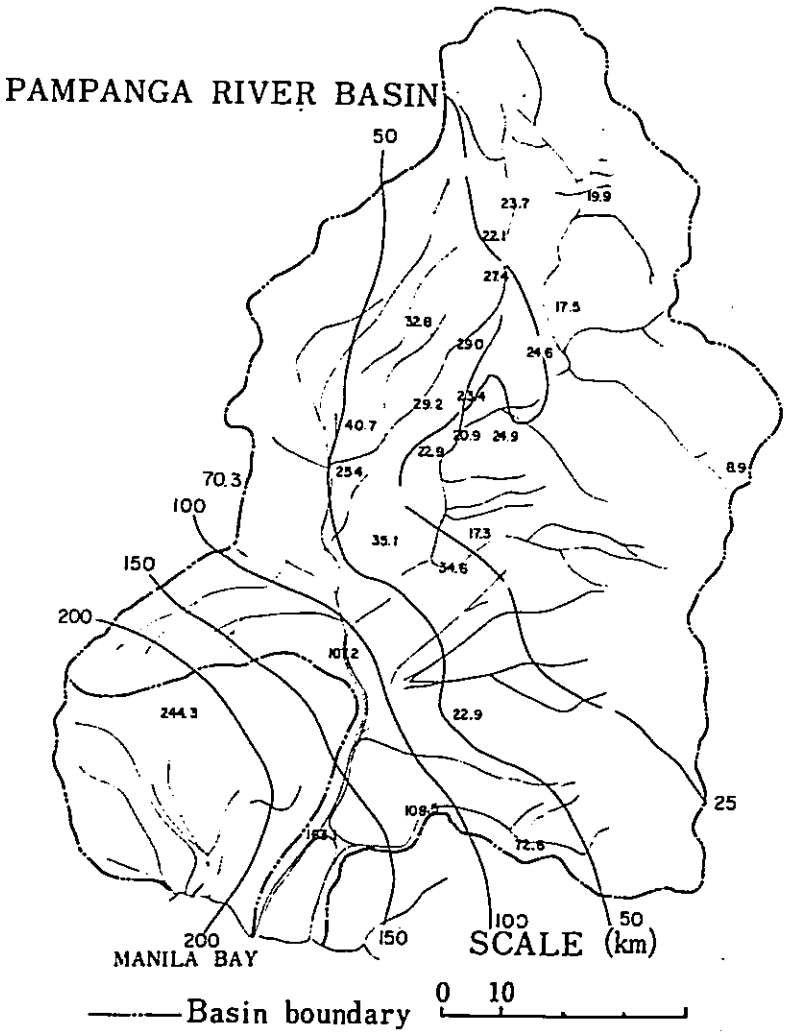


Fig. B.4.14 Isohyetal Map July 20, 1972

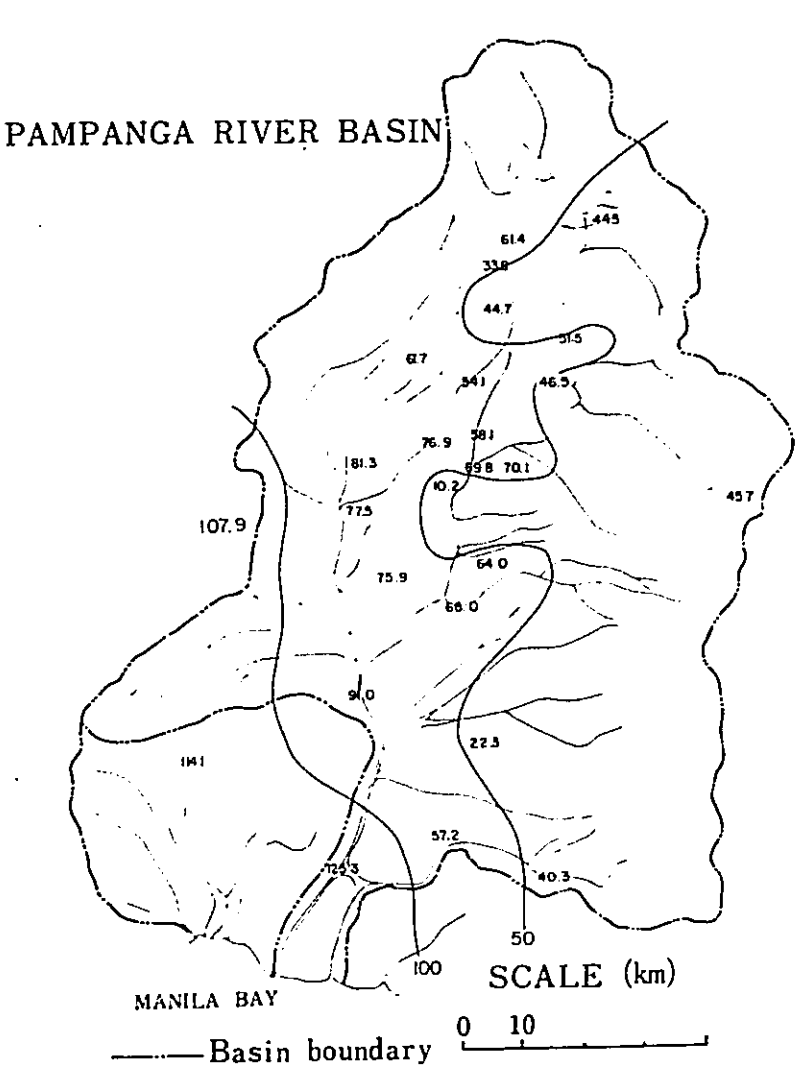


Fig. B.4.17 Isohyetal Map July 27, 1972

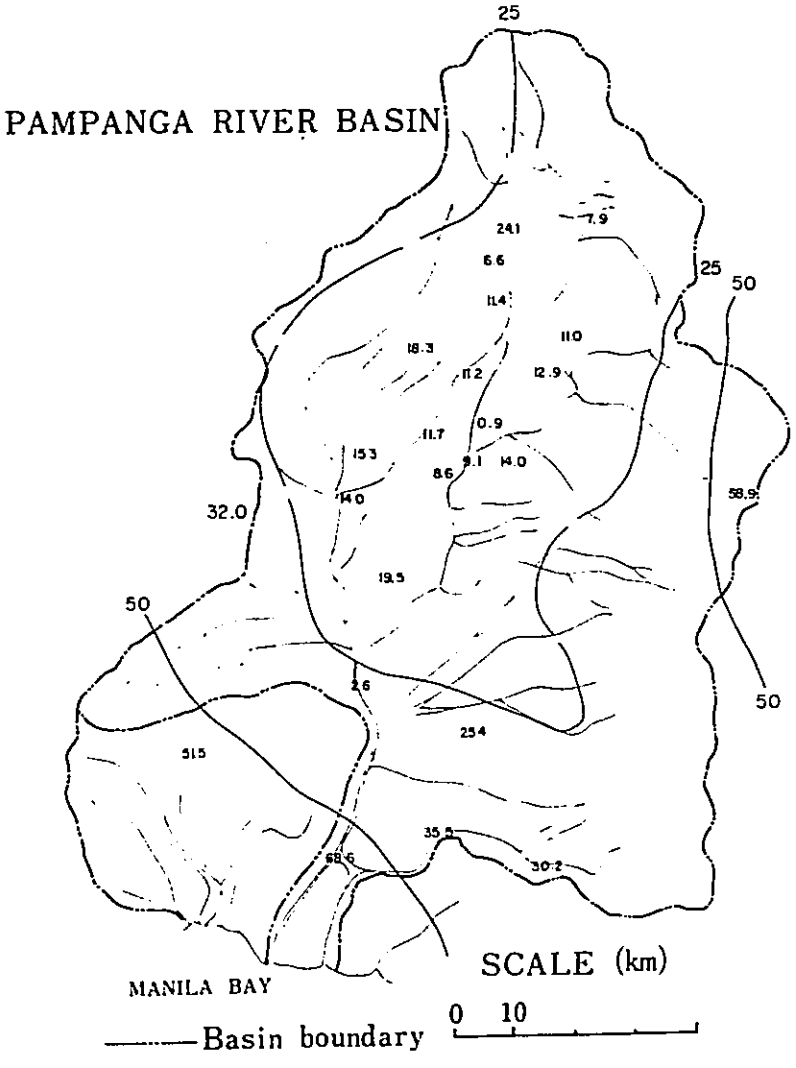


Fig. B.4.16 Isohyetal Map July 26, 1972

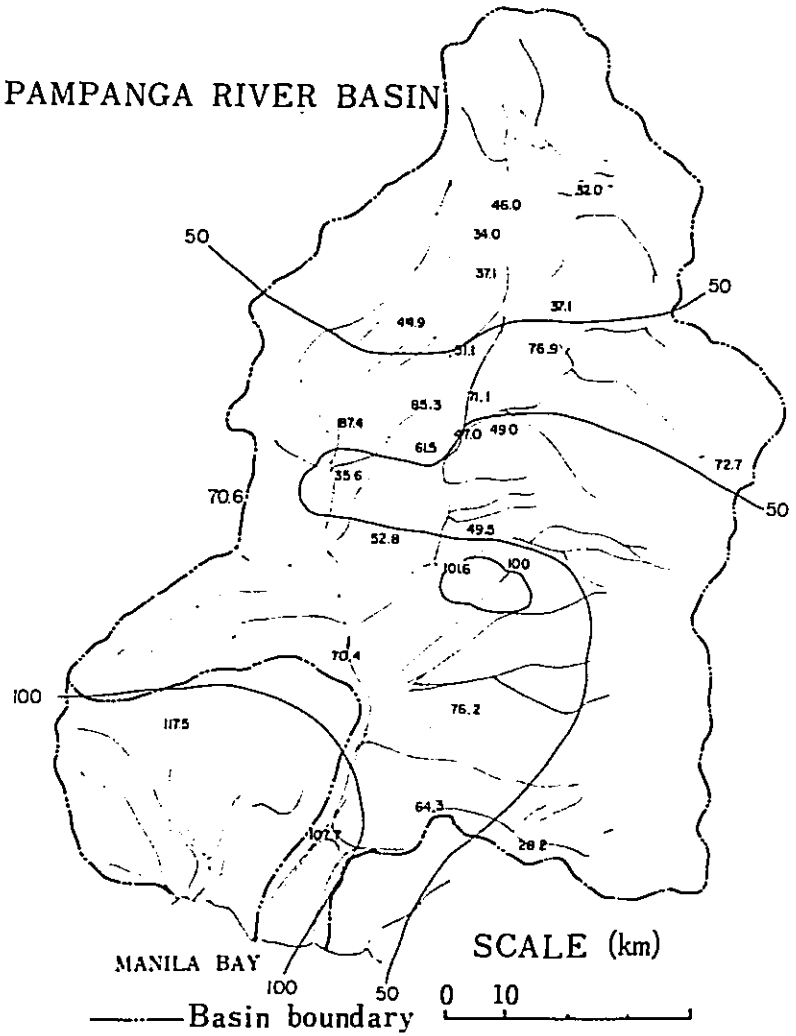


Fig. B.4.19 Isohyetal Map July 29, 1972

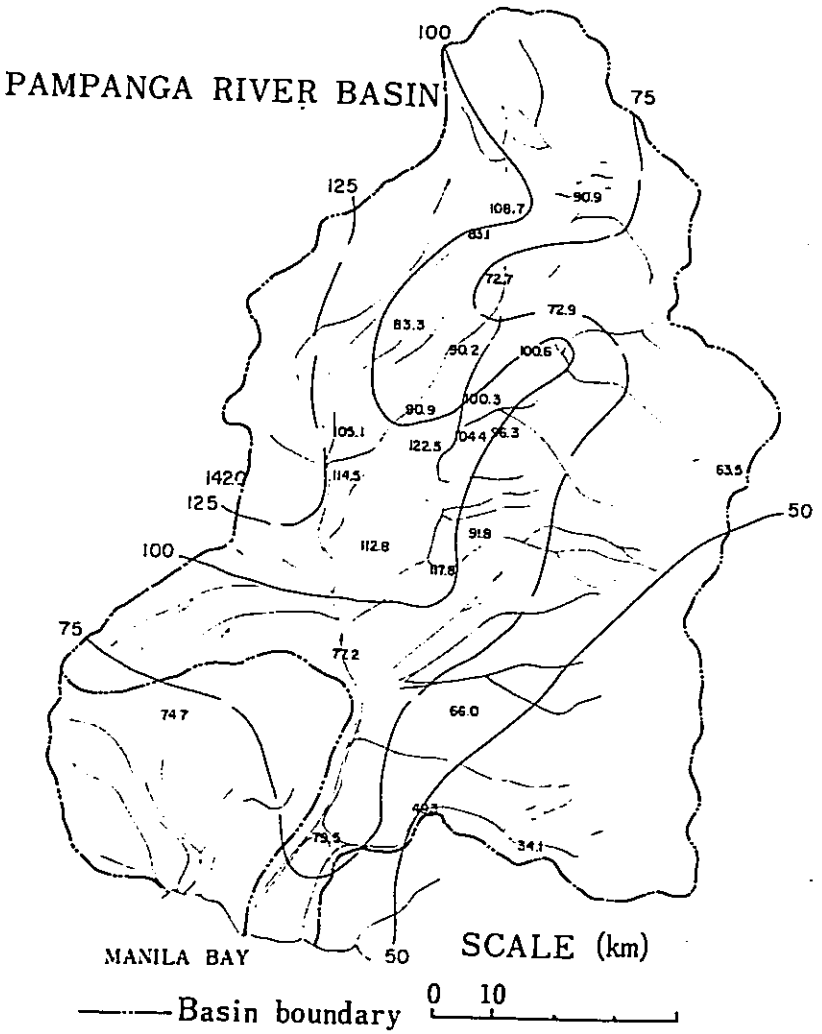


Fig. B.4.18 Isohyetal Map July 28, 1972

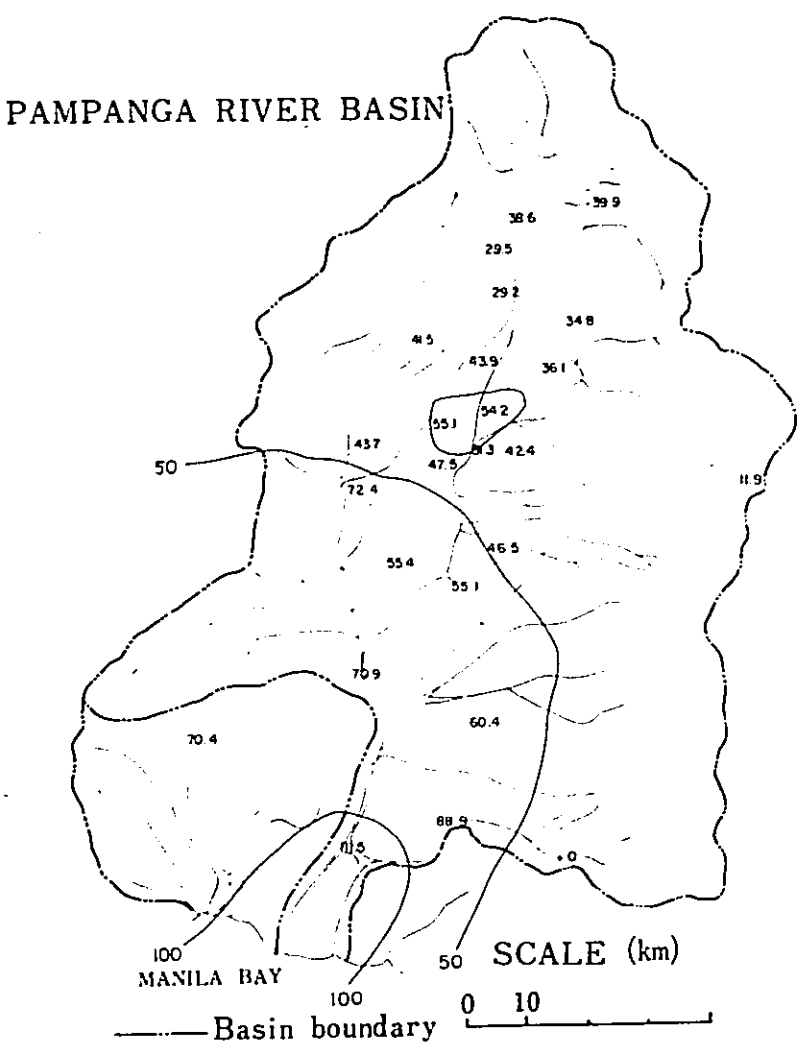


Fig. B.4.21 Isohyetal Map July 31, 1972

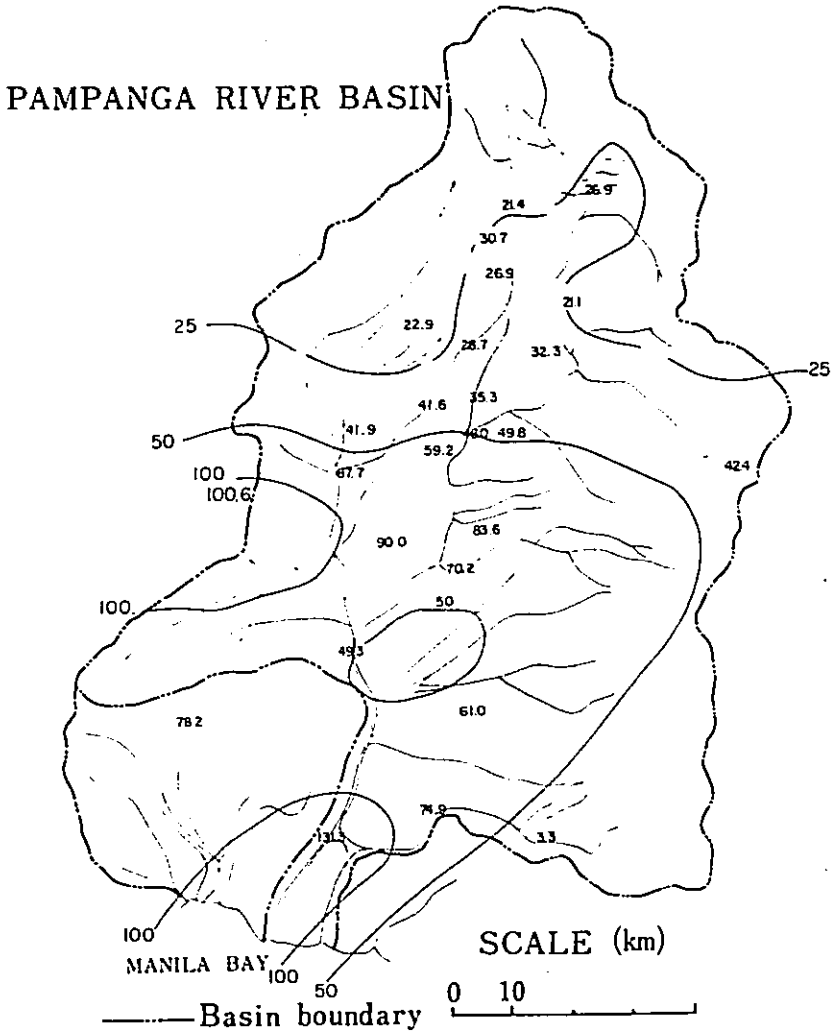


Fig. B.4.20 Isohyetal Map July 30, 1972

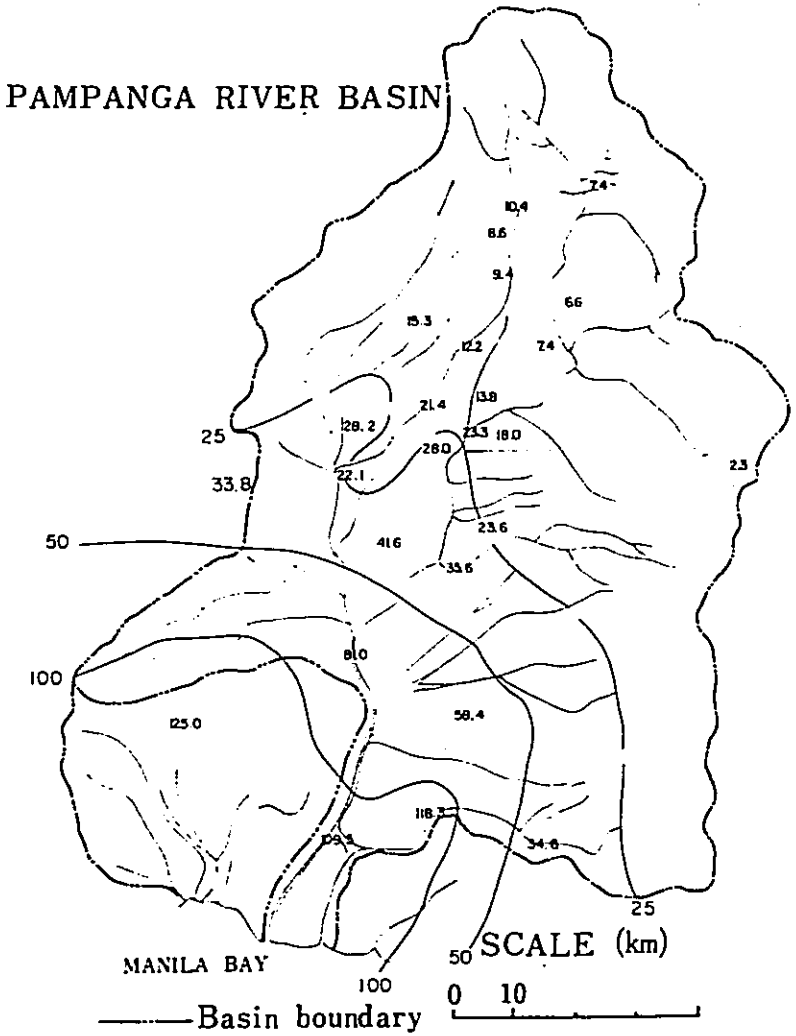


Fig. B.4.23 Isohyetal Map Aug. 2, 1972

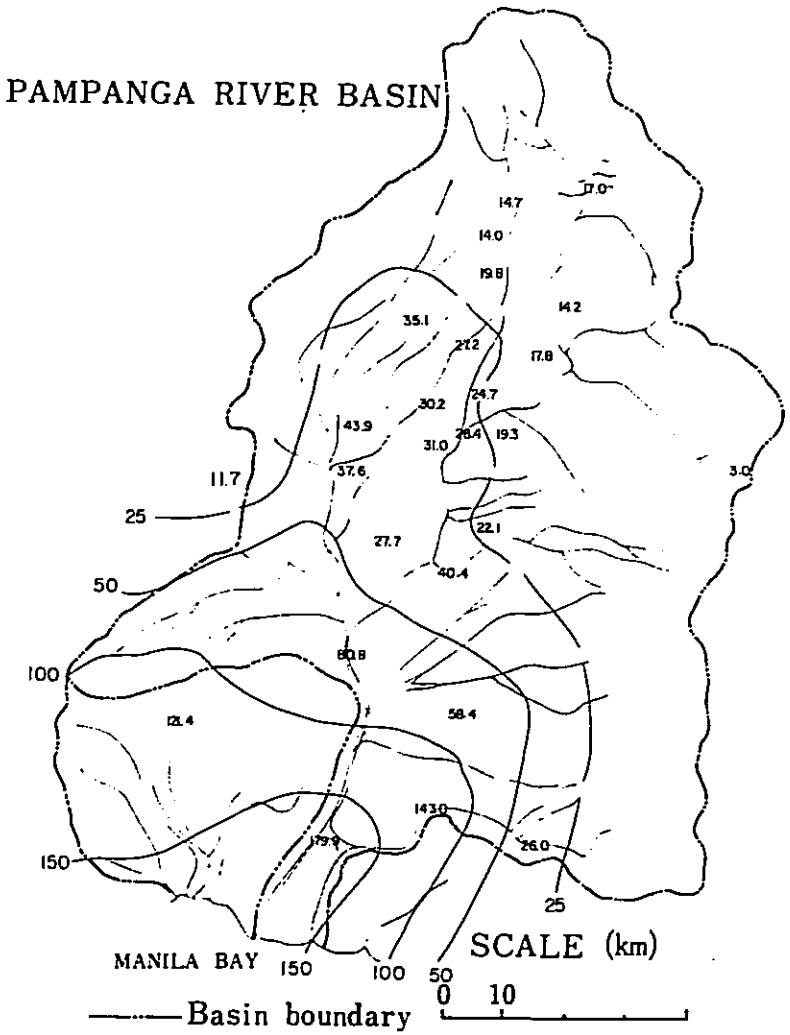


Fig. B.4.22 Isohyetal Map Aug. 1, 1972

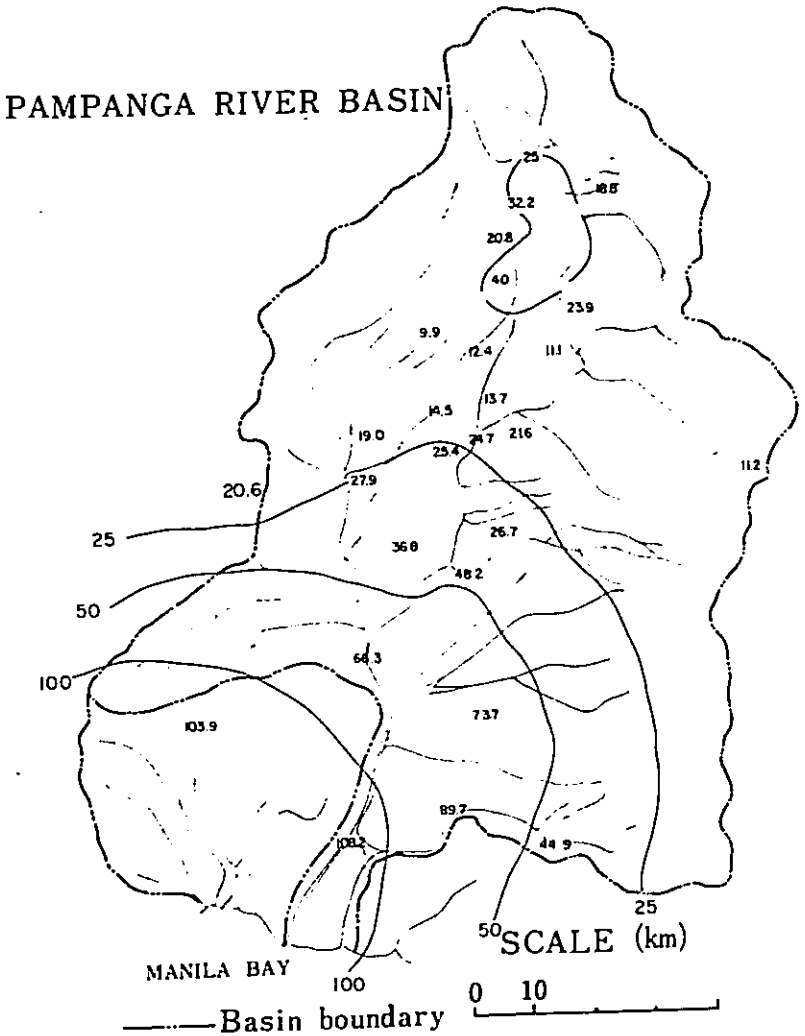


Fig. B.4.25 Isohyetal Map Aug. 4, 1972

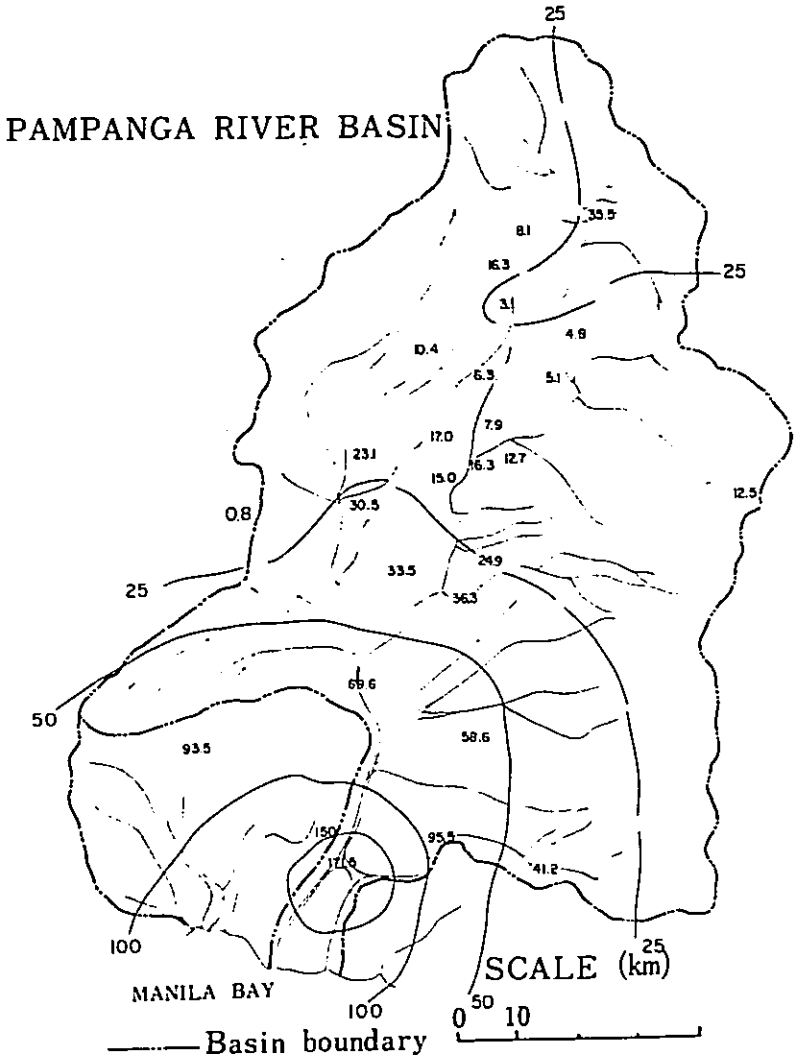


Fig. B.4.24 Isohyetal Map Aug. 3, 1972

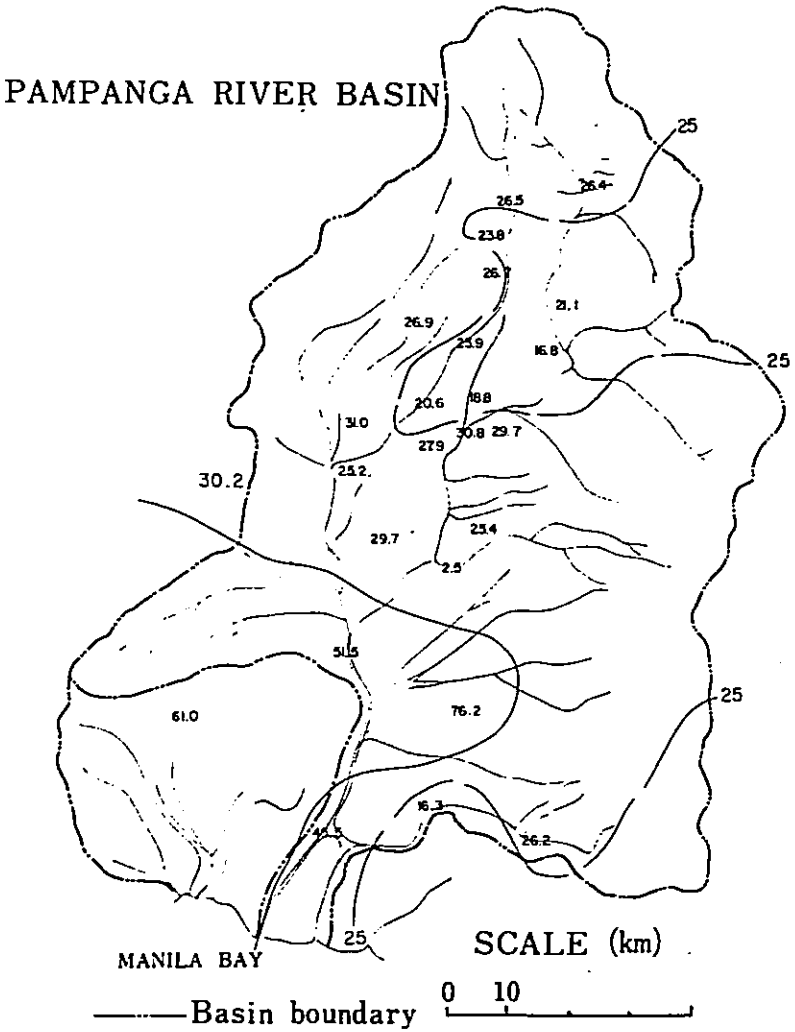


Fig. B.4.26 Isohyetal Map Aug. 5, 1972

Table B.4.31 River Gage Reading (1) July 1972

10-day summary of river-gage reading at different stations

River System : Pampanga — July 1972

No.	1		2		4		5		6		7		8	
Gaging Station	Carranglan R.	Baluarte	Pantabangan R.	Poblacion	Digmala R.	Lahi	Santor R.	Cuyapa	Santor R.	San Vicente	Coronel R.	Rangkerohan	Pampanga R.	Malate
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
1	7 1.20		8 1.17		.		.		7 1.85		8 0.79		6 0.62	
	17 1.20		17 1.17		.		.		17 1.84		17 0.78		12 0.63	
	.		.		.		.		.		.		17 0.62	
2	7 1.20		8 1.18		.		.		7 1.87		8 0.80		6 0.64	
	17 1.20		17 1.18		.		.		17 1.87		17 0.83		12 0.64	
	.		.		.		.		.		.		17 0.65	
3	7 1.21		8 1.27		7 2.87		7 1.44		7 1.88		8 0.93		6 0.66	
	17 1.21		17 1.32		.		.		17 1.89		17 0.95		12 0.67	
	.		.		.		.		.		.		17 0.67	
4	7 1.21		8 1.30		.		.		7 1.88		8 0.89		6 0.67	
	17 1.21		17 1.39		.		.		17 1.88		17 0.99		12 0.67	
	.		.		.		.		.		.		17 0.67	
5	7 1.22		8 2.52		7 2.88		7 1.44		7 1.89		8 0.93		6 0.68	
	17 1.22		17 1.78		.		.		17 1.88		17 0.89		12 0.68	
	.		.		.		.		.		.		17 0.68	
6	7 1.22		8 2.52		.		.		7 2.04		8 0.88		6 0.70	
	17 1.22		17 2.62		.		.		17 2.41		17 0.87		12 0.70	
	.		.		.		.		.		.		17 0.70	
7	7 1.80		8 2.60		7 3.66		7 2.20		7 2.65		8 2.69		6 1.90	
	17 1.80		17 2.30		.		.		17 2.85		17 2.56		12 2.10	
	.		.		.		.		.		.		17 2.23	
8	7 1.85		8 2.34		.		.		7 2.60		8 4.05		6 3.60	
	17 1.85		17 2.37		.		.		17 2.54		17 3.91		12 3.80	
	.		.		.		.		.		.		17 3.84	
9	7 1.90		8 2.73		.		.		7 2.50		8 3.20		6 3.02	
	17 1.90		17 2.36		.		.		17 2.68		17 2.60		12 3.01	
	.		.		.		.		.		.		17 3.04	
10	7 1.95		8 2.56		7 3.69		7 1.80		17 2.90		8 2.55		6 3.00	
	17 1.95		17 2.60		.		.		.		17 3.50		12 3.00	
	.		.		.		.		.		.		17 3.04	
	.		.		.		.		.		.		.	
	.		.		.		.		.		.		.	
	.		.		.		.		.		.		.	

Table B.4.30 Basin Daily Rainfall June-July-Aug. 1972

Monthly summary of basin daily rainfall (mm)

River System : Pampanga — June, July and Aug. 1972

Day \ Gaging Station	Arithmetic Mean.	Whole Pampanga R. System	June 1972	July 1972	Aug. 1972
1	.	.	.	2.6	41.9
2	.	.	.	25.1	34.5
3	.	.	.	10.1	32.7
4	.	.	.	1.0	36.8
5	.	.	.	2.1	29.8
6	.	.	.	135.3	6.8
7	.	.	.	122.5	3.0
8	.	.	.	37.5	2.8
9	.	.	.	54.7	6.2
10	.	.	.	63.4	14.6
11	.	.	.	20.8	6.0
12	.	.	.	14.6	11.6
13	.	.	.	11.7	25.0
14	.	.	.	18.8	5.8
15	.	.	.	6.3	30.3
16	.	.	.	15.3	53.8
17	.	.	.	80.6	39.9
18	.	.	.	106.5	8.4
19	.	.	.	70.4	.
20	.	.	.	48.8	14.3
21	.	.	2.4	15.7	22.6
22	.	.	3.4	6.7	20.2
23	.	.	1.2	18.8	9.1
24	.	.	25.1	9.2	16.5
25	.	.	27.8	13.2	9.5
26	.	.	1.4	22.0	8.8
27	.	.	10.0	65.9	0.3
28	.	.	13.5	90.2	0.9
29	.	.	5.4	61.9	3.4
30	.	.	3.9	52.7	11.8
31	.	.	.	51.1	6.2
Total	.	.	94.1	255.5	509.5

Table B.4.33 River Gage Reading (3) July 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1972

No.	1		2		4		5		6		7		8	
Gaging Station	Carranglan R.	Baluarte	Pantabangan R.	Poblacion	Digmala R.	Labi	Santor R.	Cuyapo	Santor R.	San Vicente	Coronel R.	Bongkerohan	Pampanga R.	Malate
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21	7	1.60	8	2.67	7	3.44	7	1.86	7	2.40	8	2.85	6	3.99
	17	1.60	17	2.59					17	2.45	17	2.60	12	3.95
													17	3.92
22	7	1.55	8	2.53					7	2.16	8	2.40	6	3.56
	17	1.55	17	2.54					17	2.09	17	2.34	12	3.65
													17	3.63
23	7	1.55	8	2.50					7	2.02	8	2.28	6	3.55
	17	1.55	17	2.47					17	1.98	17	2.26	12	3.52
													17	3.51
24	7	1.50	8	2.49	7	3.83	7	1.76	7	1.95	8	2.26	6	3.46
	17	1.50	17	2.46					17	1.90	17	2.25	12	3.46
													17	3.44
25	7	1.50	8	2.46					7	1.96	8	2.28	6	3.38
	17	1.50	17	2.47					17	1.99	17	2.34	12	3.36
													17	3.37
26	7	1.45	8	2.53	7	3.65	7	1.68	7	2.00	8	2.26	6	3.44
	17	1.45	17	2.40					17	2.20	17	2.27	12	3.49
													17	3.61
27	7	1.70	8	2.37					7	2.11	8	2.47	6	3.24
	17	1.70	17	2.35					17	2.22	17	2.49	12	3.24
													17	3.76
28	7	1.65	8	2.48	7	3.44	7	2.04	7	2.15	8	2.57	6	3.78
	17	1.65	17	2.45					17	2.80	17	2.97	12	3.78
													17	3.78
29	7	1.65	8	2.46					7	2.31	8	2.46	6	3.80
	17	1.65	17	2.59					17	2.29	17	2.36	12	3.79
													17	3.82
30	7	1.60	8	2.57			7	2.10	7	2.35	8	2.85	6	3.86
	17	1.60	17	3.08					17	2.47	17	3.87	12	3.87
													17	3.88
31	7	1.70							7	2.40	8	3.56	6	3.90
	17	1.70							17	2.45	17	3.30	12	3.90
													17	3.90

Table B.4.32 River Gage Reading (2) July 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1972

No.	1		2		4		5		6		7		8	
Gaging Station	Carranglan R.	Baluarte	Pantabangan R.	Poblacion	Digmala R.	Labi	Santor R.	Cuyapo	Santor R.	San Vicente	Coronel R.	Bongkerohan	Pampanga R.	Malate
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	7	1.55	8	2.57					7	2.43	8	2.44	6	3.62
	17	1.55	17	2.56					17	2.42	17	3.43	12	3.66
													17	3.69
12	7	1.60	8	2.50	7	3.60	7	1.96	7	2.42	8	3.24	6	3.70
	17	1.50	17	2.47					17	2.43	17	2.14	12	3.76
													17	3.78
13	7	1.45	8	2.45					7	2.53	8	3.05	6	3.70
	17	1.45	17	2.40					17	2.57	17	2.86	12	3.71
													17	3.65
14	7	1.40	8	2.48	7	3.62	7	1.98	7	2.60	8	2.86	6	3.60
	17	1.40	17	2.56					17	2.65	17	2.86	12	3.66
													17	3.62
15	7	1.45	8	2.57					7	2.61	8	3.08	6	3.58
	17	1.45	17	2.59					17	2.59	17	2.78	12	3.53
													17	3.49
16	7	1.50	8	2.83					7	2.43	8	2.76	6	3.22
	17	1.50	17	2.80					17	2.46	17	2.75	12	3.19
													17	3.15
17	7	1.55	8	2.76	7	2.88	7	1.86	7	2.00	8	2.68	6	2.99
	17	1.55	17	2.72					17	2.05	17	2.54	12	2.96
													17	2.92
18	7	1.60	8	2.72					7	2.00	8	2.47	6	3.90
	17	1.60	17	2.70					17	2.06	17	2.42	12	3.85
													17	3.94
19	7	1.80	8	2.65	7	3.45	7	1.92	7	2.00	8	3.20	6	4.15
	17	1.80	17	2.67					17	2.30	17	3.90	12	4.25
													17	4.80
20	7	1.75	8	2.63					7	2.38	8	3.60	6	3.89
	17	1.75	17	2.60					17	2.43	17	3.60	12	3.96
													17	3.94

Table B.4.35 River Gage Reading (5) July 1972

10-day summary of river-gage reading at different stations

River System : Pampanga — July 1972

No.	9		10		11		12		13		14		15	
Gaging Station	Cabu R.	Cabu	Pampanga R.	Valdefuente	Tabuating R.	Soledad	Pampanga R.	San Antom	Chico R.	Ilog na Hunti	Sumacbao R.	Pine	Penaranda R. (U.M.)	San Josef
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11		.	7	5.00	7	6.00		.		.	7	1.20	6	30.20
		.		.	17	2.00		.		.	17	1.31	17	30.20
		.		.		.		.		.		.		.
12	6	3.00	7	5.00	7	2.00	7	7.03	7	2.40	7	1.40	6	30.10
		.		.	17	2.30		.	17	2.56	17	1.49	17	30.10
		.		.		.		.		.		.		.
13		.	7	5.00	7	3.00		.		.	7	1.38	6	30.10
		.		.	17	4.00		.		.	17	1.45	17	30.10
		.		.		.		.		.		.		.
14	6	1.87	7	5.00	7	2.80	7	5.83	7	2.20	7	1.34	6	30.10
		.		.	17	2.76		.	17	2.26	17	1.36	17	30.10
		.		.		.		.		.		.		.
15		.	7	5.00	7	2.72		.		.	7	1.24	6	30.00
		.		.	17	2.70		.		.	17	1.22	17	30.00
		.		.		.		.		.		.		.
16	6	1.62	7	5.00	7	2.60		.		.	7	1.20	6	30.00
		.		.	17	3.00		.		.	17	1.18	17	30.00
		.		.		.		.		.		.		.
17		.	7	4.50	7	3.20	7	5.28	7	1.58	7	1.10	6	30.00
		.		.	17	3.30		.	17	2.01	17	1.17	17	30.00
		.		.		.		.		.		.		.
18		.	7	4.58	7	4.00		.		.	7	1.12	6	30.10
		.		.	17	3.00		.		.	17	1.07	17	30.40
		.		.		.		.		.		.		.
19	6	1.60	7	4.59	7	2.80	7	7.94	7	2.80	7	2.35	6	30.85
		.		.	17	2.80		.	17	2.10	17	2.02	17	31.00
		.		.		.		.		.		.		.
20		.	7	4.80	7	5.00		.		.	7	1.82	6	30.30
		.		.	17	3.00		.		.	17	1.25	17	30.20
		.		.		.		.		.		.		.
		.		.		.		.		.		.		.
		.		.		.		.		.		.		.
		.		.		.		.		.		.		.

Table B.4.34 River Gage Reading (4) July 1972

10-day summary of river-gage reading at different stations

River System : Pampanga — July 1972

No.	9		10		11		12		13		14		15	
Gaging Station	Cabu R.	Cabu	Pampanga R.	Valdefuente	Tabuating R.	Soledad	Pampanga R.	San Antom	Chico R.	Ilog na Hunti	Sumacbao R.	Pine	Penaranda R. (U.M.)	San Josef
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1		.	7	3.26	7	1.92		.		.	7	0.61	6	29.40
		.		.	17	1.92		.		.	17	0.60	17	29.40
		.		.		.		.		.		.		.
2		.	7	3.26	7	1.90		.		.	7	0.60	6	29.45
		.		.	17	1.90		.		.	17	0.62	17	29.45
		.		.		.		.		.		.		.
3	6	0.52	7	3.27	7	1.90	7	2.34	6	1.56	7	0.59	6	29.45
		.		.	17	1.88		.	17	1.55	17	0.58	17	29.45
		.		.		.		.		.		.		.
4		.	7	3.28	7	1.88		.		.	7	0.63	6	29.50
		.		.	17	1.86		.		.	17	0.64	17	29.25
		.		.		.		.		.		.		.
5	6	0.54	7	3.29	7	1.86	7	2.50	6	1.58	7	0.62	6	29.50
		.		.	17	1.80		.	17	1.57	17	0.61	17	29.40
		.		.		.		.		.		.		.
6		.	7	3.00	7	1.90		.		.	7	0.60	6	29.40
		.		.	17	2.00		.		.	17	0.61	17	29.40
		.		.		.		.		.		.		.
7	6	3.00	7	3.10	7	7.00	7	5.06		.	7	3.07	6	32.30
		.		.	17	5.00		.		.	17	2.57	17	30.60
		.		.		.		.		.		.		.
8		.	7	5.00	7	8.00	8	8.16		.	7	3.20	6	32.60
		.		.	17	6.00	10	8.34		.	17	2.98	17	31.20
		.		.		.	12	8.50		.		.		.
9		.	7	5.00	7	7.00	14	8.50		.	7	1.60	6	30.20
		.		.	17	3.00	16	8.48		.	17	1.50	17	30.20
		.		.		.	18	8.45		.		.		.
10	6	3.00	7	5.00	7	5.00	7	6.23	6	2.46	7	1.34	6	30.10
		.		.	17	4.00		.		.	17	1.28	17	30.00
		.		.		.		.		.		.		.
		.		.		.		.		.		.		.
		.		.		.		.		.		.		.
		.		.		.		.		.		.		.

Table B.4.37 River Gage Reading (7) July 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1972

No.	16		17		19		20		21		22		23	
Gaging Station	Penaranda R. (RR Br.)	San Josef	Penaranda R.	Poblacion	Baliwag R.	Catalanacan	Bamban R.	Pasong Intsik	Talavera R.	Lomboy	Talavera	Caboloanan	Rio Chico R.	Sto. Rosario
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
1	6 26.60		7 2.26						7 1.38				7 4.63	
	17 26.61								17 1.40				17 4.61	
2	6 26.62		7 2.26						7 1.41				7 4.58	
	17 26.60								17 1.43				17 4.65	
3	6 26.60		7 2.26		6 0.52		6 2.55		7 1.45		7 1.10		7 4.90	
	17 26.59								17 1.39				17 5.24	
4	6 26.60		7 2.26						7 1.46				7 5.48	
	17 26.61								17 1.46				17 5.56	
5	6 26.58		7 2.26		6 0.50		6 2.50		7 1.47		7 1.10		7 5.62	
	17 26.59								17 1.47				17 5.68	
6	6 26.57		7 2.26						7 1.48				7 5.84	
	17 26.58		12 2.26						17 1.48				17 5.96	
			18 2.26											
7	6 over		7 7.20		6 2.80		6 5.50		7 2.00		7 1.13		7 6.38	
	17 over		12 6.10						17 3.70				17 6.75	
			18 5.50											
8	6 over		7 6.20				6 8.00		7 2.01				7 7.14	
	17 over		12 6.70						17 3.58				17 7.30	
			18 6.20											
9	6 28.00		7 5.50						7 2.06				7 7.51	
	17 28.85		12 5.25						17 3.87				17 7.68	
			18 5.02											
10	6 28.35		7 4.70		6 1.40		6 5.70		7 2.00		7 1.20		7 7.76	
	17 28.00		12 4.20						17 3.90				17 7.87	
			18 4.12											

Table B.4.36 River Gage Reading (6) July 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1972

No.	9		10		11		12		13		14		15	
Gaging Station	Cabu R.	Cabu	Pampanga R.	Valdefuente	Tabuating R.	Soledad	Pampanga R.	San Anton	Chico R.	Ilog na Hunti	Sumacbao R.	Pins	Penaranda R. (U.S.)	San Josef
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
21	6 1.53		7 4.77		7 2.80		7 6.70		7 2.19		7 1.02		6 30.10	
					17 2.90				17 2.10		17 1.00		17 30.10	
22			7 4.60		7 3.00						7 0.98		6 30.10	
					17 3.00						17 0.85		17 30.10	
23			7 4.00		7 4.00						7 1.03		6 30.10	
					17 3.20						17 1.00		17 30.10	
24	6 1.35		7 4.00		7 3.00		7 5.10		7 1.86		7 1.02		6 30.10	
					17 3.00				17 1.85		17 1.05		17 30.10	
25			7 3.87		7 3.00						7 1.10		6 30.10	
					17 4.00						17 1.08		17 30.10	
26	6 1.33		7 3.86		7 4.40		7 5.45		7 1.77		7 1.05		6 30.00	
					17 5.70				17 2.02		17 1.01		17 30.00	
27			7 3.76		7 6.00						7 0.97		6 30.00	
					17 6.90						17 0.95		17 30.00	
28	6 1.37		7 3.75		7 6.30		7 5.84		7 2.47		7 1.11		6 30.30	
					17 6.00				17 2.48		17 1.08		17 30.40	
29			7 3.70		7 8.00						7 2.97		6 31.20	
					17 8.00						17 2.20		17 30.60	
30			7 3.68		7 8.80						7 3.21		6 31.70	
					17 8.00						17 3.10		17 30.60	
31	6 3.00		7 3.67		7 9.00		7 7.92		7 2.98		7 1.97		6 30.60	
					17 5.00				17 2.64		17 1.69		17 30.40	

Table B.4.39 River Gage Reading (9) July 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1972

No.	16		17		19		20		21		22		23	
Gaging Station	Penaranda R. (RR Br.)	San Josef	Penaranda R.	Poblacion	Baliwag R.	Catalanacan	Benituan R.	Pasong Intalk	Talavera R.	Lomboy	Talavera	Caboloonan	Rio Chico R.	Sto. Rosario
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
21	6 28.40		7 3.90		6 2.31		6 6.10		7 3.39		7 1.80		7 8.28	
	17 28.20		12 3.90		.		.		17 3.37		.		17 8.23	
	.		17 3.90		.		.		.		.		.	
22	6 28.00		7 3.90		.		.		7 3.28		.		7 8.18	
	17 27.95		12 3.90		.		.		17 3.19		.		17 8.16	
	.		17 3.90		.		.		.		.		.	
23	6 27.92		7 3.90		.		.		7 3.12		.		7 8.12	
	17 27.90		12 3.82		.		.		17 3.03		.		17 8.11	
	.		17 3.80		.		.		.		.		.	
24	6 27.85		7 3.78		6 1.20		6 2.20		7 2.00		7 2.00		7 8.09	
	17 27.88		12 3.70		.		.		17 2.00		.		17 8.07	
	.		17 3.70		.		.		.		.		.	
25	6 27.80		7 3.78		.		.		7 2.05		.		7 8.05	
	17 27.83		12 3.78		.		.		17 2.17		.		17 8.07	
	.		17 3.76		.		.		.		.		.	
26	6 27.65		7 3.74		6 2.00		6 2.52		7 2.18		7 1.90		7 8.12	
	17 27.70		12 3.72		.		.		17 2.17		.		17 8.15	
	.		17 3.70		.		.		.		.		.	
27	6 27.50		7 3.70		.		.		7 2.90		.		7 8.21	
	17 27.45		12 3.78		.		.		17 2.97		.		17 8.26	
	.		17 3.80		.		.		.		.		.	
28	6 27.25		7 4.00		6 1.74		6 3.30		7 3.00		7 2.00		7 8.34	
	17 27.20		12 4.00		.		.		17 4.15		.		17 8.39	
	.		17 4.00		.		.		.		.		.	
29	6 over		7 4.20		.		6 6.40		7 3.86		.		7 8.43	
	17 over		12 4.20		.		.		17 3.90		.		17 8.46	
	.		17 4.50		.		.		.		.		.	
30	6 over		7 5.20		.		.		7 3.44		.		7 8.56	
	17 over		12 5.50		.		.		17 3.09		.		17 8.62	
	.		17 5.20		.		.		.		.		.	
31	6 28.40		7 5.00		6 2.53		6 6.00		.		7 2.00		7 8.73	
	17 28.00		12 4.80		.		.		.		.		17 8.81	
	.		17 4.75		.		.		.		.		.	

Table B.4.38 River Gage Reading (8) July 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1972

No.	16		17		19		20		21		22		23	
Gaging Station	Penaranda R. (RR Br.)	San Josef	Penaranda R.	Poblacion	Baliwag R.	Catalanacan	Benituan R.	Pasong Intalk	Talavera R.	Lomboy	Talavera	Caboloonan	Rio Chico R.	Sto. Rosario
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
11	6 28.25		7 4.08		.		.		7 3.04		.		7 7.94	
	17 28.15		12 4.02		.		.		17 3.88		.		17 8.00	
	.		17 4.00		.		.		.		.		.	
12	6 28.10		7 4.00		6 1.80		6 4.68		7 3.24		7 1.19		7 8.14	
	17 27.97		12 4.00		.		.		17 3.20		.		17 8.18	
	.		17 4.00		.		.		.		.		.	
13	6 27.90		7 3.90		.		.		7 2.89		.		7 8.12	
	17 28.00		12 3.82		.		.		17 2.90		.		17 8.07	
	.		17 3.80		.		.		.		.		.	
14	6 27.95		7 3.78		6 1.43		6 3.25		7 2.00		7 1.18		7 8.01	
	17 27.80		12 3.70		.		.		17 2.00		.		17 7.96	
	.		17 3.70		.		.		.		.		.	
15	6 27.83		7 3.60		.		.		7 2.00		.		7 7.90	
	17 27.78		12 3.60		.		.		17 2.00		.		17 7.81	
	.		17 3.60		.		.		.		.		.	
16	6 27.80		7 3.60		.		.		7 2.01		.		7 7.76	
	17 27.90		12 3.60		.		.		17 2.01		.		17 7.70	
	.		17 3.60		.		.		.		.		.	
17	6 28.05		7 3.60		6 1.42		6 3.52		7 2.00		7 2.00		7 7.81	
	17 28.00		12 3.80		.		.		17 3.80		.		17 7.82	
	.		17 3.80		.		.		.		.		.	
18	6 28.10		7 3.80		.		.		7 2.43		.		7 7.96	
	17 27.95		12 3.80		.		.		17 3.08		.		17 7.99	
	.		17 3.80		.		.		.		.		.	
19	6 over		7 3.80		6 2.40		6 6.45		7 3.00		7 2.00		7 8.12	
	17 over		12 3.80		.		.		17 3.80		.		17 8.18	
	.		17 3.80		.		.		.		.		.	
20	6 28.60		7 3.80		.		.		7 3.49		.		7 8.25	
	17 26.50		12 3.80		.		.		17 3.48		.		17 8.39	
	.		17 3.80		.		.		.		.		.	
	.		.		.		.		.		.		.	
	.		.		.		.		.		.		.	
	.		.		.		.		.		.		.	

Table B.4.41 River Gage Reading (11) July 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1972

No.	27		40		46									
Gaging Station	Pampanga R.	San Agustin	Pampanga R.	Sulipan	Angat R.	Longos								
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	7	13.36	6	15.44										
	17	13.40	12	15.47										
			17	15.53										
12	7	13.44	6	15.55										
	17	13.42	12	15.56										
			17	15.57										
13	7	13.28	6	15.57										
	17	13.17	12	15.56										
			17	15.55										
14	7	13.03	6	15.42										
	17	12.92	12	15.36										
			17	15.22										
15	7	12.79	6	15.16										
	17	12.70	12	15.12										
			17	15.10										
16	7	12.59	6	15.06										
	17	12.53	12	15.04										
			17	15.01										
17	7	12.60	6	14.92	7	11.98								
	17	12.38	12	14.86	12	11.50								
			17	14.82	17	11.20								
18	7	12.62	6	14.92	7	11.50								
	17	12.58	12	15.00	12	11.30								
			17	15.02	17	11.10								
19	7	13.14	6	15.16	7	11.48								
	17	13.50	12	15.22	12	11.28								
			17	15.35	17	8.98								
20	7	13.98	6	15.66	7	10.95								
	17	13.92	12	15.77	12	11.40								
			17	15.90	17	8.89								

Table B.4.40 River Gage Reading (10) July 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1972

No.	27		40		46									
Gaging Station	Pampanga R.	San Agustin	Pampanga R.	Sulipan	Angat R.	Longos								
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	7	5.92	6	11.30										
	17	5.88	12	11.50										
			17	11.52										
2	7	5.85	6	11.50										
	17	5.89	12	11.52										
			17	11.50										
3	7	5.97	6	11.50										
	17	6.05	12	11.52										
			17	11.50										
4	7	6.20	6	11.52										
	17	6.38	12	11.54										
			17	11.52										
5	7	6.43	6	11.58										
	17	6.35	12	11.52										
			17	11.40										
6	7	6.25	6	11.70										
	17	6.23	12	11.56										
			17	11.60										
7	7	7.02	6	12.30										
	17	9.28	12	12.86										
			17	13.38										
8	7	11.72	6	13.90										
	17	12.21	12	14.30										
			17	14.42										
9	7	12.92	6	14.88										
	17	13.06	12	15.02										
			17	15.14										
10	7	13.26	6	15.38										
	17	13.30	12	15.35										
			17	15.36										

Table B.4.43 River Gage Reading (13) Aug. 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1972

No.	1		2		4		5		6		7		8	
Gaging Station	Carranglan R.	Baluarte	Pantabangan R.	Poblacion	Digsala R.	Labi	Santor R.	Cuyapa	Santor R.	San Vicente	Coronel R.	Bangkerohan	Pampanga R.	Malata
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	7	1.50	8	2.77					7	2.28	8	3.25	6	2.99
	17	1.50	17	2.70					17	2.37	17	3.11	12	2.97
													17	2.97
2	7	1.45	8	2.68	7	3.48	7	1.98	7	2.20	8	3.08	6	2.95
	17	1.45	17	2.62					17	2.25	17	2.93	12	2.95
													17	2.95
3	7	1.40	8	2.60					7	2.19	8	2.89	6	2.89
	17	1.40	17	2.55					17	2.30	17	2.87	12	2.89
													17	2.89
4	7	1.40	8	2.52	7	3.47	7	1.94	7	2.20	8	2.85	6	2.88
	17	1.40	17	2.54					17	2.20	17	2.83	12	2.88
													17	2.88
5	7	1.35	8	2.50					7	2.17	8	2.76	6	2.85
	17	1.35	17	2.43					17	2.18	17	2.70	12	2.85
													17	2.85
6	7	1.37	8	2.46					7	2.10	8	2.67	6	2.80
	17	1.37	17	2.47					17	2.11	17	2.61	12	2.80
													17	2.79
7	7	1.37	8	2.42	7	3.65	7	1.98	7	2.00	8	2.56	6	2.72
	17	1.37	17	2.38					17	2.00	17	2.50	12	2.78
													17	2.77
8	7	1.38	8	2.36					7	2.01	8	2.45	6	2.75
	17	1.38	17	2.30					17	1.98	17	2.36	12	2.75
													17	2.75
9	7	1.40	8	2.34	7	3.66	7	1.94	7	2.00	8	2.25	6	2.73
	17	1.40	17	2.31					17	1.95	17	2.18	12	2.73
													17	2.72
10	7	1.40	8	2.30					7	2.03	8	2.09	6	2.68
	17	1.40	17	2.37					17	1.99	17	2.08	12	2.68
													17	2.68

Table B.4.42 River Gage Reading (12) July 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — July 1972

No.	27		40		46									
Gaging Station	Pampanga R.	San Agustin	Pampanga R.	Sulipan	Angat R.	Longos								
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21	7	13.70	6	16.04	7	11.55								
	17	13.55	12	16.08	12	11.38								
			17	16.12	17	0.98								
22	7	13.38	6	16.00	7	11.70								
	17	13.18	12	15.60	12	11.40								
			17	15.50	17	0.96								
23	7	12.98	6	15.41	7	11.22								
	17	12.86	12	15.38	12	11.50								
			17	15.31	17	0.98								
24	7	12.66	6	15.23	7	11.20								
	17	12.56	12	15.10	12	11.40								
			17	15.06	17	0.96								
25	7	12.48	6	15.00	7	0.96								
	17	12.39	12	14.96	12	0.90								
			17	14.82	17	0.86								
26	7	12.32	6	14.82	7	11.68								
	17	12.33	12	14.78	12	11.20								
			17	14.72	17	0.75								
27	7	12.20	6	14.80	7	11.75								
	17	12.32	12	14.62	12	11.00								
			17	14.64	17	0.80								
28	7	12.61	6	14.80	7	0.80								
	17	12.73	12	14.78	12	0.80								
			17	14.80	17	0.80								
29	7	13.00	6	15.00	7	11.48								
	17	13.25	12	15.12	12	11.00								
			17	15.16	17	0.85								
30	7	13.50	6	15.58	7	0.86								
	17	13.61	12	15.44	12	11.20								
			17	15.28	17	0.82								
31	7	13.62	6	16.00	7	0.86								
	17	13.56	12	16.12	12	11.00								
			17	16.16	17	0.82								

Table B.4.45 River Gage Reading (15) Aug. 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1972

No.	1		2		4		5		6		7		8	
Gaging Station	Carranglan R.	Baluarte	Pantabangan R.	Poblacion	Digmala R.	Labi	Santor R.	Cuyapa	Santor R.	San Vicente	Coronel R.	Bangkerohan	Pampanga R.	Malate
Day	Time / Gage Height (m)													
21	7 1.38		8 2.57		7 3.38		7 1.66		7 1.90		8 2.23		8 2.66	
	17 1.38		17 2.55						17 1.90		17 2.17		12 2.66	
													17 2.68	
22	7 1.37		8 2.54						7 1.90		8 2.69		6 2.69	
	17 1.37		17 2.53						17 1.91		17 2.53		12 2.69	
													17 2.69	
23	7 1.37		8 2.50		7 3.37		7 1.62		7 1.95		8 2.31		6 2.72	
	17 1.37		17 2.46								17 2.20		12 2.72	
													17 2.70	
24	7 1.37		8 2.37						7 1.87		8 2.20		6 2.56	
	17 1.37		17 2.32						17 1.88		17 2.28		12 2.45	
													17 2.44	
25	7 1.35		8 2.30		7 3.37		7 1.68		7 2.00		8 2.39		6 2.38	
	17 1.35		17 2.34						17 2.00		17 2.29		12 2.34	
													17 2.34	
26	7 1.35		8 2.27						7 1.99		8 2.26		6 2.35	
	17 1.35		17 2.00						17 1.94		17 2.40		12 2.35	
													17 2.34	
27	7 1.35		8 2.16						7 1.91		8 2.24		6 2.28	
	17 1.35		17 2.20						17 1.89		17 2.22		12 2.28	
													17 2.27	
28	7 1.34		8 2.00		7 3.34		7 1.62		7 1.85		8 2.19		6 2.21	
	17 1.34		17 2.05						17 1.80		17 2.18		12 2.21	
													17 2.21	
29	7 1.34		8 2.20						7 1.83		8 2.16		6 2.19	
	17 1.34		17 2.00						17 1.80		17 2.10		12 2.19	
													17 2.19	
30	7 1.36		8 2.08		7 3.33		7 1.60		7 1.80		8 2.05		6 2.16	
	17 1.36		17 1.97						17 1.80		17 1.93		12 2.16	
													17 2.16	
31	7 1.36								7 2.05		8 1.99		6 2.10	
	17 1.36								17 1.92		17 3.36		12 2.10	
													17 2.10	

Table B.4.44 River Gage Reading (14) Aug. 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1972

No.	1		2		4		5		6		7		8	
Gaging Station	Carranglan R.	Baluarte	Pantabangan R.	Poblacion	Digmala R.	Labi	Santor R.	Cuyapa	Santor R.	San Vicente	Coronel R.	Bangkerohan	Pampanga R.	Malate
Day	Time / Gage Height (m)													
11	7 1.45		8 2.35		7 3.68		7 1.86		7 2.10		8 2.10		6 2.62	
	17 1.45		17 2.32						17 2.00		17 2.09		12 2.62	
													17 2.62	
12	7 1.45		8 2.33						7 2.08		8 2.07		6 2.59	
	17 1.45		17 2.30						17 1.97		17 2.09		12 2.59	
													17 2.58	
13	7 1.43		8 2.47						7 1.98		8 2.12		6 2.56	
	17 1.43		17 2.46						17 1.97		17 2.09		12 2.56	
													17 2.56	
14	7 1.43		8 2.89		7 3.88		7 1.98		7 1.90		8 2.22		6 2.52	
	17 1.43		17 2.45						17 1.89		17 2.18		12 2.52	
													17 2.52	
15	7 1.44		8 2.48						7 1.94		8 2.18		6 2.48	
	17 1.44		17 2.46						17 2.02		17 2.14		12 2.48	
													17 2.46	
16	7 1.42		8 2.32		7 3.87		7 1.98		7 2.00		8 2.28		6 2.42	
	17 1.42		17 2.30						17 2.10		17 2.65		12 2.42	
													17 2.41	
17	7 1.42		8 3.78						7 2.00		8 3.30		6 2.42	
	17 1.42		17 3.65						17 2.21		17 2.83		12 2.42	
													17 2.42	
18	7 1.40		8 3.70		7 3.70		7 1.84		7 2.30		8 2.67		6 2.55	
	17 1.40		17 3.48						17 2.20		17 2.62		12 2.56	
													17 2.56	
19	7 1.40		8 2.76						7 2.19		8 2.60		6 2.58	
	17 1.40		17 2.73						17 2.12		17 2.40		12 2.59	
													17 2.61	
20	7 1.38		8 2.63						7 2.04		8 2.34		6 2.62	
	17 1.38		17 2.64						17 2.05		17 2.29		12 2.62	
													17 2.62	

Table B.4.47 River Gage Reading (17) Aug. 1972
10-day summary of river-gage reading
at different stations

River System : Pampanga Aug. 1972

No.	9		10		11		12		13		14		15	
Gaging Station	Cabu R.	Cabu	Pampanga R.	Valdefuente	Tabuating R.	Soledad	Pampanga R.	San Anton	Chico R.	Ilog na Hunti	Sumacbao R.	Plan	Penaranda R. (II.W.)	San Josef
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	6	1.54	7	3.20	7	2.20	7	4.88	7	2.10	7	1.17	6	30.30
					17	2.30			17	1.81	17	1.08	17	30.25
12			7	2.90	7	6.00					7	1.05	6	30.20
					17	4.00					17	1.02	17	30.15
13			7	2.60	7	3.80					7	0.97	6	30.15
					17	3.40					17	1.02	17	30.20
14	6	1.35	7	2.58	7	3.00	7	5.74	7	1.89	7	1.24	6	30.20
					17	3.00			17	1.78	17	1.16	17	30.20
15			7	2.40	7	3.00					7	1.00	6	30.20
					17	3.00					17	0.98	17	30.20
16	6	1.80	7	2.40	7	3.00	7	5.04	7	1.78	7	1.06	6	30.20
					17	4.00			17	1.82	17	1.09	17	30.20
17			7	4.85	7	6.00	7	5.69			7	1.24	6	30.40
					17	8.00					17	1.30	17	30.80
18	6	2.45	7	4.20	7	7.00			7	2.43	7	1.52	6	30.40
					17	4.20			17	2.17	17	1.29	17	30.30
19			7	3.30	7	3.30					7	1.09	6	30.20
					17	3.00					17	1.01	17	30.20
20			7	2.40	7	3.40					7	0.98	6	30.10
					17	3.60					17	0.96	17	30.10

Table B.4.46 River Gage Reading (16) Aug. 1972
10-day summary of river-gage reading
at different stations

River System : Pampanga Aug. 1972

No.	9		10		11		12		13		14		15	
Gaging Station	Cabu R.	Cabu	Pampanga R.	Valdefuente	Tabuating R.	Soledad	Pampanga R.	San Anton	Chico R.	Ilog na Hunti	Sumacbao R.	Plan	Penaranda R. (II.W.)	San Josef
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1			7	5.00	7	6.00	7	6.45			7	1.76	6	30.30
					17	6.30					17	1.69	17	30.30
2	6	1.72	7	5.00	7	5.60			7	2.20	7	1.43	6	30.20
					17	4.00			17	2.27	17	1.40	17	30.20
3			7	5.00	7	3.10					7	1.35	6	30.10
					17	3.20					17	1.62	17	30.00
4	6	1.70	7	4.80	7	3.00	7	5.38	7	2.04	7	1.44	6	30.00
					17	2.90			17	2.39	17	1.38	17	30.55
5			7	4.60	7	2.86					7	1.29	6	30.20
					17	2.84					17	1.19	17	30.20
6			7	4.10	7	2.82					7	1.10	6	30.00
					17	2.80					17	1.05	17	30.00
7	6	1.65	7	4.00	7	2.78	7	5.48	7	1.92	7	1.02	6	30.00
					17	2.76			17	1.85	17	0.99	17	30.00
8			7	3.50	7	2.74					7	1.03	6	29.95
					17	2.70					17	1.01	17	29.95
9	6	1.60	7	3.40	7	2.64	7	4.57	7	1.72	7	0.98	6	29.95
					17	2.60			17	1.67	17	0.97	17	30.00
10			7	3.40	7	2.50					7	1.24	6	30.15
					17	2.40					17	1.27	17	30.10

Table B.4.49 River Gage Reading (19) Aug. 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1972

No.	16		17		19		20		21		22		23	
Gaging Station	Penaranda R. (RR Br.)	San Josef	Penaranda R.	Poblacion	Baliwag R.	Catalanacan	Benituan R.	Pasong Intsik	Talavera R.	Lomboy	Talavera	Caboloonan	Rio Chico R.	Sto. Rosario
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
1	6 27.90		7 4.60						7 2.00				7 8.87	
	17 27.80		12 4.50						17 2.00				17 8.95	
			17 4.50											
2	6 27.75		7 4.30		6 1.91		6 5.70		7 2.00		7 0.90		7 8.80	
	17 27.60		12 4.20						17 2.00		17 2.00		17 8.87	
			17 4.10											
3	6 27.50		7 4.07						7 2.00				7 8.75	
	17 27.30		12 3.92						17 2.01				17 8.77	
			17 3.87											
4	6 27.10		7 3.82		6 1.38		6 3.80		7 2.00		7 2.00		7 8.67	
	17 27.00		12 3.80						17 2.00		17 2.00		17 8.63	
			17 4.80											
5	6 26.98		7 4.60						7 2.00				7 8.87	
	17 26.95		12 4.40						17 2.00				17 8.59	
			17 4.32											
6	6 26.90		7 4.18						7 2.02				7 8.57	
	17 26.91		12 4.02						17 2.02				17 8.45	
			17 4.00											
7	6 26.93		7 3.97		6 1.40		6 2.15		7 2.00		7 2.00		7 8.34	
	17 26.90		12 3.80						17 2.00		17 1.90		17 8.28	
			17 3.75											
8	6 26.89		7 3.70						7 1.99				7 8.22	
	17 26.88		12 3.60						17 1.99				17 8.17	
			17 3.60											
9	6 26.91		7 3.60		6 1.07		6 1.80		7 1.96		7 1.86		7 8.15	
	17 27.05		12 3.60						17 1.94		17 1.86		17 8.13	
			17 3.60											
10	6 27.05		7 3.60						7 1.87				7 8.10	
	17 27.03		12 3.60						17 1.87				17 8.08	
			17 3.80											

Table B.4.48 River Gage Reading (18) Aug. 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1972

No.	9		10		11		12		13		14		15	
Gaging Station	Cabu R.	Cabu	Pampanga R.	Valdefuente	Tabuating R.	Soledad	Pampanga R.	San Anton	Chico R.	Ilog na Munti	Sumacbeo R.	Plan	Penaranda R. (U.H.)	San Josef
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
21	6 1.90		7 1.95		7 7.60				7 1.66		7 0.94		6 30.00	
					17 4.70				17 1.62		17 0.93		17 30.00	
22			7 1.87		7 4.90						7 0.92		6 30.00	
					17 4.00						17 0.98		17 30.00	
23	6 1.95		7 1.87		7 5.00				7 1.67		7 0.95		6 30.00	
					17 3.00				17 1.65		17 0.93		17 30.05	
24			7 1.76		7 2.90						7 0.92		6 30.10	
					17 3.90						17 0.91		17 30.10	
25	6 1.97		7 1.76		7 3.20				7 1.99		7 1.00		6 30.10	
					17 5.40				17 1.85		17 1.07		17 30.15	
26			7 1.55		7 4.00						7 1.03		6 30.15	
					17 3.00						17 1.01		17 30.15	
27			7 1.90		7 3.30						7 0.91		6 30.05	
					17 3.60						17 0.88		17 30.05	
28	6 1.50		7 2.50		7 5.00				7 1.67		7 0.87		6 30.05	
					17 4.00				17 1.90		17 0.86		17 30.05	
29			7 2.45		7 3.80						7 0.85		6 30.05	
					17 3.40						17 0.83		17 30.05	
30	6 1.40		7 2.86		7 3.00				7 1.62		7 0.84		6 30.00	
					17 4.30				17 1.60		17 0.92		17 30.00	
31			7 2.85		7 2.90						7 2.12		6 31.00	
					17 2.30						17 2.91		17 31.00	

Table B.4.51 River Gage Reading (21) Aug. 1972

10-day summary of river-gage reading at different stations

River System : Pampanga — Aug. 1972

No.	16		17		19		20		21		22		23	
Gaging Station	Penaranda R. (RR Br.)	San Josef	Penaranda R.	Poblacion	Baliwag R.	Catalanacan	Benituan R.	Paseng Intake	Talavera R.	Lomboy	Talavera	Caboloonan	Rio Chico R.	Sto. Rosario
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
21	6 27.03		7 3.74		6 1.48		6 1.85		7 1.87		7 1.90		7 8.28	
	17 27.05		12 3.72						17 1.91		17 1.90		17 8.24	
			17 3.72											
22	6 27.02		7 3.72						7 1.86				7 8.37	
	17 27.04		12 3.70						17 1.87				17 8.42	
			17 3.70											
23	6 27.00		7 3.70		6 2.30		6 5.10		7 1.84		7 1.89		7 8.39	
	17 27.01		12 3.70						17 1.84		17 1.89		17 8.34	
			17 3.70											
24	6 27.05		7 3.70						7 1.80				7 8.30	
	17 27.08		12 3.70						17 1.87				17 8.21	
			17 3.70											
25	6 27.06		7 3.70		6 1.20		6 2.45		7 1.77		7 1.75		7 8.18	
	17 27.05		12 3.68						17 1.92		17 1.75		17 8.16	
			17 3.68											
26	6 27.07		7 3.68						7 1.84				7 8.12	
	17 27.04		12 3.66						17 1.80				17 8.09	
			17 3.64											
27	6 27.03		7 3.64						7 1.79				7 8.05	
	17 27.00		12 3.70						17 1.81				17 8.08	
			17 3.70											
28	6 27.00		7 3.60		6 1.00		6 1.75		7 1.73		7 2.00		7 7.89	
	17 27.00		12 3.60						17 2.00		17 2.00		17 7.81	
			17 3.60											
29	6 27.01		7 3.60						7 2.00				7 7.72	
	17 27.02		12 3.60						17 2.00				17 7.64	
			17 3.60											
30	6 27.00		7 3.60		6 0.86		6 1.62		7 2.00		7 1.90		7 7.57	
	17 27.00		12 3.60						17 2.00		17 1.90		17 7.82	
			17 3.60											
31	6 over		7 3.60										7 7.32	
	17 over		12 3.80										17 7.29	
			17 4.60											

Table B.4.50 River Gage Reading (20) Aug. 1972

10-day summary of river-gage reading at different stations

River System : Pampanga — Aug. 1972

No.	16		17		19		20		21		22		23	
Gaging Station	Penaranda R. (RR Br.)	San Josef	Penaranda R.	Poblacion	Baliwag R.	Catalanacan	Benituan R.	Paseng Intak	Talavera R.	Lomboy	Talavera	Caboloonan	Rio Chico R.	Sto. Rosario
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
11	6 27.00		7 4.20		6 0.92		6 2.26		7 1.85		7 1.80		7 8.07	
	17 27.10		12 4.10						17 1.84		17 1.80		17 8.06	
			17 4.00											
12	6 27.46		7 4.00						7 1.80				7 7.90	
	17 27.40		12 3.98						17 1.82				17 7.72	
			17 3.93											
13	6 27.25		7 4.20						7 1.78				7 7.84	
	17 27.00		12 4.10						17 1.76				17 7.79	
			17 4.07											
14	6 27.00		7 3.60		6 1.02		6 3.00		7 1.75		7 1.78		7 7.18	
	17 27.00		12 3.60						17 1.74		17 1.78		17 7.12	
			17 3.60											
15	6 26.98		7 3.60						7 1.74				7 7.06	
	17 27.04		12 3.60						17 1.76				17 7.01	
			17 3.80											
16	6 26.95		7 3.70		6 1.88		6 1.95		7 1.91		7 1.75		7 7.10	
	17 27.05		12 3.90						17 2.00		17 1.75		17 7.23	
			17 3.75											
17	6 27.45		7 3.80						7 2.00				7 7.36	
	17 over		12 3.80						17 2.00				17 7.45	
			17 4.20											
18	6 27.10		7 4.00		6 2.57		6 6.20		7 2.00		7 2.00		7 7.58	
	17 28.00		12 3.92						17 2.00		17 2.00		17 7.69	
			17 3.80											
19	6 27.60		7 3.80						7 1.96				7 7.82	
	17 27.40		12 3.80						17 1.97				17 7.88	
			17 3.78											
20	6 27.18		7 3.74						7 1.96				7 8.16	
	17 27.00		12 3.78						17 1.95				17 8.32	
			17 3.74											

Table B.4.53 River Gage Reading (23) Aug. 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1972

No.	27		40		46							
Gaging Station	Pampanga R.	San Agustin	Pampanga R.	Sulipan	Angat R.	Longos						
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11	7	11.40	6	14.16	7	0.70						
	12	11.41	12	14.08	12	0.68						
	17	11.38	17	14.02	17	0.65						
12	7	11.23	6	13.92	7	11.13						
	12	11.20	12	13.89	12	0.90						
	17	11.14	17	13.86	17	0.72						
13	7	11.06	6	13.82	7	0.76						
	12	11.00	12	13.77	12	0.92						
	17	10.98	17	13.72	17	0.80						
14	7	11.01	6	13.70	7	0.75						
	12	11.08	12	13.69	12	0.77						
	17	11.10	17	13.65	17	0.80						
15	7	10.93	6	13.60	7	0.76						
	12	10.97	12	13.58	12	0.79						
	17	10.85	17	13.50	17	0.82						
16	7	10.75	6	13.48	7	0.77						
	12	10.81	12	13.40	12	0.80						
	17	10.97	17	13.42	17	0.86						
17	7	11.55	6	13.69	7	0.80						
	12	11.71	12	13.94	12	11.00						
	14:30	11.80										
	17	11.89	17	14.05	17	0.90						
18	7	12.37	6	14.28	7	11.20						
	12	12.42	12	14.32	12	0.98						
	17	12.46	17	14.36	17	0.80						
19	7	12.47	6	14.70	7	11.30						
	12	12.45	12	14.71	12	11.40						
	17	12.41	17	14.71	17	11.20						
20	7	12.33	6	14.52	7	11.40						
	12	12.29	12	14.50	12	11.25						
	17	12.22	17	14.46	17	0.93						

Table B.4.52 River Gage Reading (22) Aug. 1972

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1972

No.	27		40		46							
Gaging Station	Pampanga R.	San Agustin	Pampanga R.	Sulipan	Angat R.	Longos						
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	7	13.44	6	16.34	7	0.76						
	12	13.35	12	16.49	12	11.70						
			17	16.41	17	0.96						
2	7	13.22	6	16.28	7	11.72						
	17	13.15	12	16.22	12	11.30						
			17	16.00	17	0.90						
3	7	13.07	6	15.85	7	0.85						
	17	13.00	12	15.78	12	0.80						
			17	15.68	17	0.78						
4	7	12.90	6	15.62	7	0.80						
	17	12.87	12	15.58	12	0.81						
			17	15.56	17	0.78						
5	7	12.83	6	15.48	7	0.80						
	17	12.81	12	15.45	12	0.81						
			17	15.39	17	0.78						
6	7	12.76	6	15.22	7	0.76						
	17	12.72	12	15.20	12	0.74						
			17	15.14	17	0.73						
7	7	12.60	6	15.03	7	0.70						
	17	12.50	12	15.04	12	0.70						
			17	14.96	17	0.69						
8	7	12.37	6	14.82	7	0.70						
	17	12.27	12	14.76	12	0.68						
			17	14.68	17	0.66						
9	7	12.06	6	14.58	7	0.80						
	17	11.89	12	14.56	12	0.76						
			17	14.42	17	0.70						
10	7	11.70	6	14.30	7	0.82						
	12	11.47	12	14.26	12	0.71						
	17	11.59	17	14.22	17	0.66						

Table B.4.55 Mean Daily Gage Height at Sulipan, Apalit June-July-Aug. 1972

Monthly summary of mean daily gage height (m)

River System : Pampanga

June, July and Aug. 1972

No. 40

Day \ Gaging Station: Pampanga Sulipan, Apalit	June 1972	July 1972	Aug. 1972
1	11.07	11.44	16.38
2	11.13	11.51	16.17
3	11.10	11.51	15.77
4	11.06	11.49	15.59
5	11.08	11.50	15.42
6	11.14	11.62	15.19
7	11.08	12.25	15.01
8	11.01	14.21	14.75
9	11.12	15.01	14.52
10	11.20	15.35	14.26
11	11.17	15.48	14.09
12	11.12	15.58	13.89
13	11.08	15.56	13.77
14	11.04	15.33	13.68
15	11.05	15.13	13.56
16	11.04	15.03	13.49
17	11.00	14.87	13.89
18	11.04	14.98	14.32
19	11.00	15.24	14.71
20	10.93	15.74	14.49
21	10.92	16.09	14.37
22	10.89	15.70	14.18
23	10.89	15.37	14.01
24	10.92	15.13	13.88
25	11.23	14.96	13.77
26	11.22	14.77	13.65
27	11.18	14.42	13.58
28	11.15	14.79	13.49
29	11.07	15.09	13.36
30	11.15	15.67	13.22
31		16.19	13.32

Table B.4.54 River Gage Reading (24) Aug. 1972

10-day summary of river-gage reading at different stations

River System : Pampanga

Aug. 1972

No.	27		40		46							
Gaging Station	Pampanga R. — San Agustin		Pampanga R. — Sulipan		Angat R. — Lonoy							
Day	Time	Gage Height m	Time	Gage Height m	Time	Gage Height m	Time	Gage Height m	Time	Gage Height m	Time	Gage Height m
21	7	12.10	6	14.38	7	11.38						
	12	12.05	12	16.22	12	11.10						
	17	11.99	17	14.36	17	0.92						
22	7	11.86	6	14.20	7	11.20						
	12	11.90	12	15.18	12	11.88						
	17	11.97	17	14.16	17	0.93						
23	7	11.80	6	14.04	7	11.60						
	12	11.73	12	14.00	12	11.55						
	17	11.67	17	13.98	17	11.50						
24	7	11.62	6	13.90	7	12.28						
	12	11.54	12	13.82	12	11.90						
	17	11.51	17	13.85	17	11.93						
25	7	11.44	6	13.80	7	12.30						
	12	11.41	12	13.76	12	11.50						
	17	11.45	17	13.74	17	11.10						
26	7	11.33	6	13.68	7	11.36						
	12	11.29	12	13.65	12	11.98						
	17	11.29	17	13.63	17	11.90						
27	7	11.19	6	13.60	7	11.80						
	12	11.17	12	13.58	12	11.72						
	17	11.21	17	13.58	17	11.60						
28	7	11.00	6	13.52	7	11.82						
	12	10.90	12	13.48	12	11.70						
	17	10.85	17	13.46	17	11.50						
29	7	10.61	6	13.40	7	11.98						
	12	10.56	12	13.36	12	11.70						
	17	10.52	17	13.32	17	11.53						
30	7	10.26	6	13.20	7	11.98						
	12	10.18	12	13.22	12	11.72						
	17	10.10	17	13.24	17	11.50						
31	7	9.92	6	13.22	7	12.20						
	12	10.18	12	13.32	12	11.68						
	17	10.45	17	13.32	17	11.48						

Table 8.4.56 Date and Time of Peak Hourly Rainfall, and that of Corresponding Peak Hourly Gage Height: Time Difference between Two Peaks July 1972

	Date and Time of Peak Rainfall				Date and Time of Peak Gage Height	Time Difference between Two Peaks (hr)
	No.	Location		No.	Location		
(First Phase)						
1)	15	PRIS Dam	July 7,4:00	1	Baluarte	July 7,10:00	
2)	33	Mallorca	July 7,4:00	4	Labi	July 7,10:00	
3)	32	Lambakin	July7, 4:00	12	San Anton	July 8,14:00	
4)	28	Zaragoza		13	Ilong Na Munti	July 7, 2:00	
5)	38	Arayat	July7, 5:00				
6)	40	San Miguel					
7)	35	Gapan	July7,5:00				
8)	52	Ipo					
9)	47	Sabang					
10)	48	Apalit					
(Second Phase)						
1)	15	PRIS Dam	July18,3:00	1	Baluarte	July18,2:30	
20	33	Mallorca	July19,7:00	2	Labi		
3)	32	Lambakin	July19,7:00	12	San Anton	July17,4:00	
4)	28	Zaragoza	July19,7:00	13	Ilong Na Munti	July19,13:00	
5)	38	Arayat					
6)	40	San Miguel					
7)	35	Gapan	July19,7:00				
8)	52	Ipo					
9)	47	Sabang					
10)	48	Apalit	July19,7:00	40	Sulipan	July21,17:00	59
(Third Phase)						
1)	15	PRIS Dam	July29,2:00	1	Baluarte	July29,3:00	1
2)	33	Mallorca	July29,2:00	4	Labi	July29,5:00	3
3)	32	Lambakin		12	San Anton	July30,4:00	
4)	28	Zaragoza	July30,19:00				
5)	38	Arayat	July30,4:00	27	Arayat	July31,7:00	27
6)	40	San Miguel					
7)	35	Gapan	July30,5:00				
8)	52	Ipo					
9)	47	Sabang					
10)	48	Apalit	July30,22:00	40	Sulipan	Aug.1,17:00	43

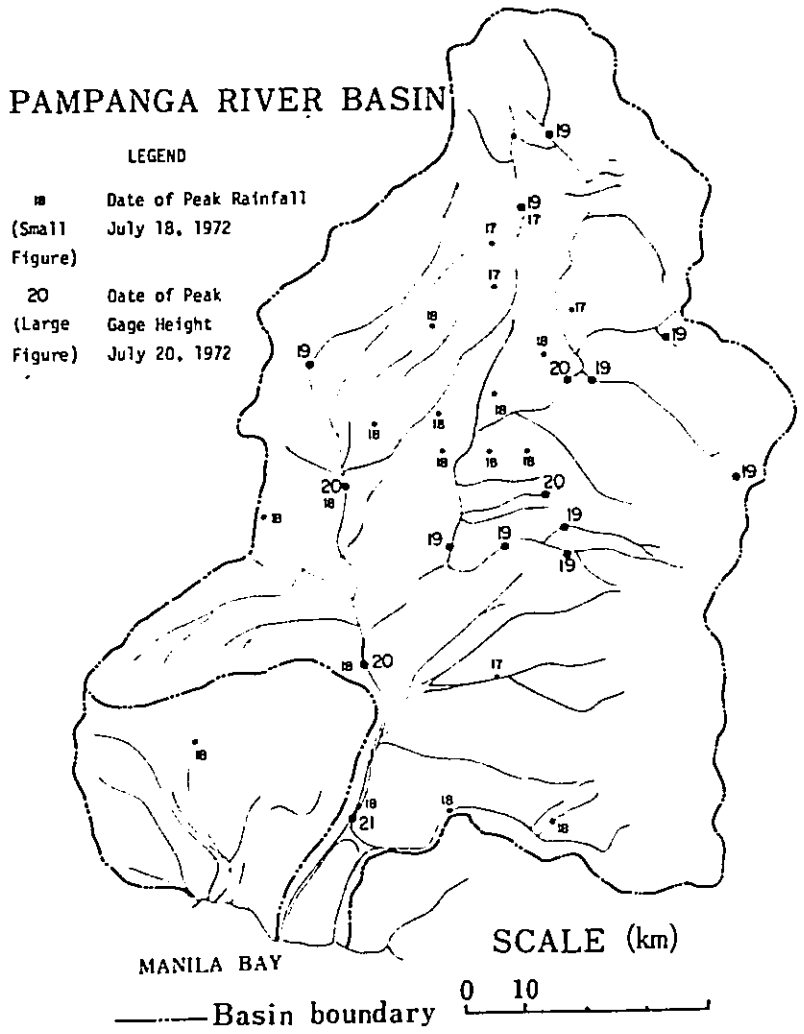


Fig. B.4.28 Date of Peak Daily Rainfall and Corresponding Peak Gage Height (1) July 1972

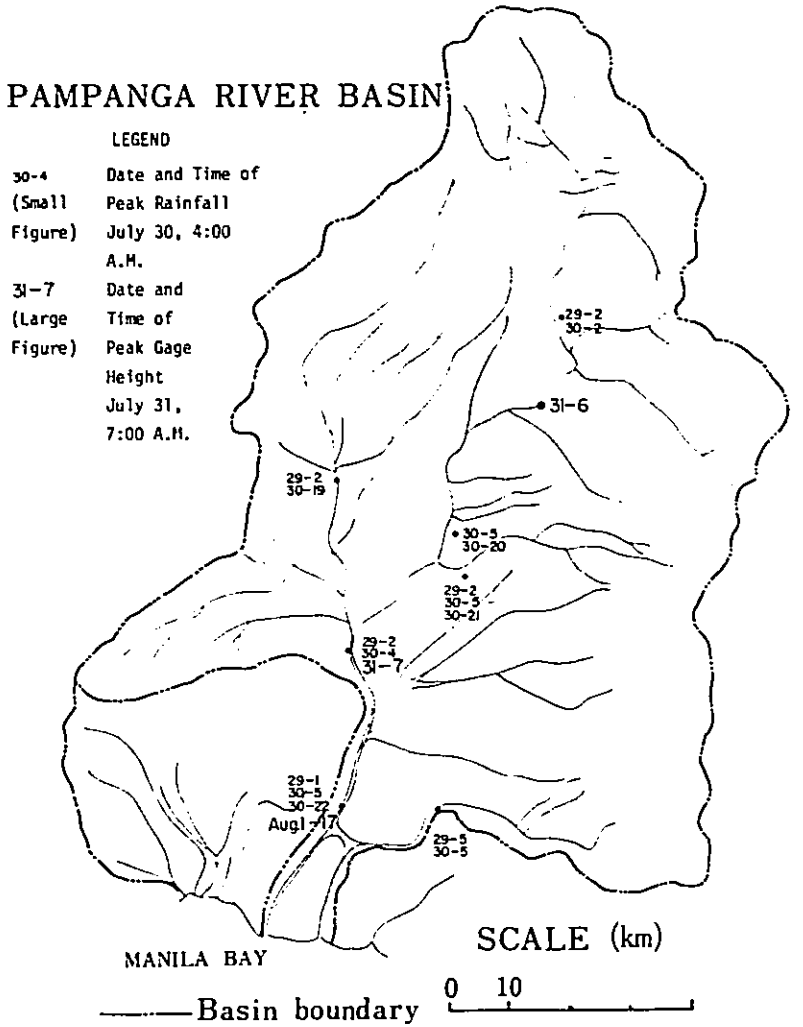


Fig. B.4.27 Date and Time of Peak Hourly Rainfall, and that of corresponding Peak Hourly Gage Height July-Aug. 1972

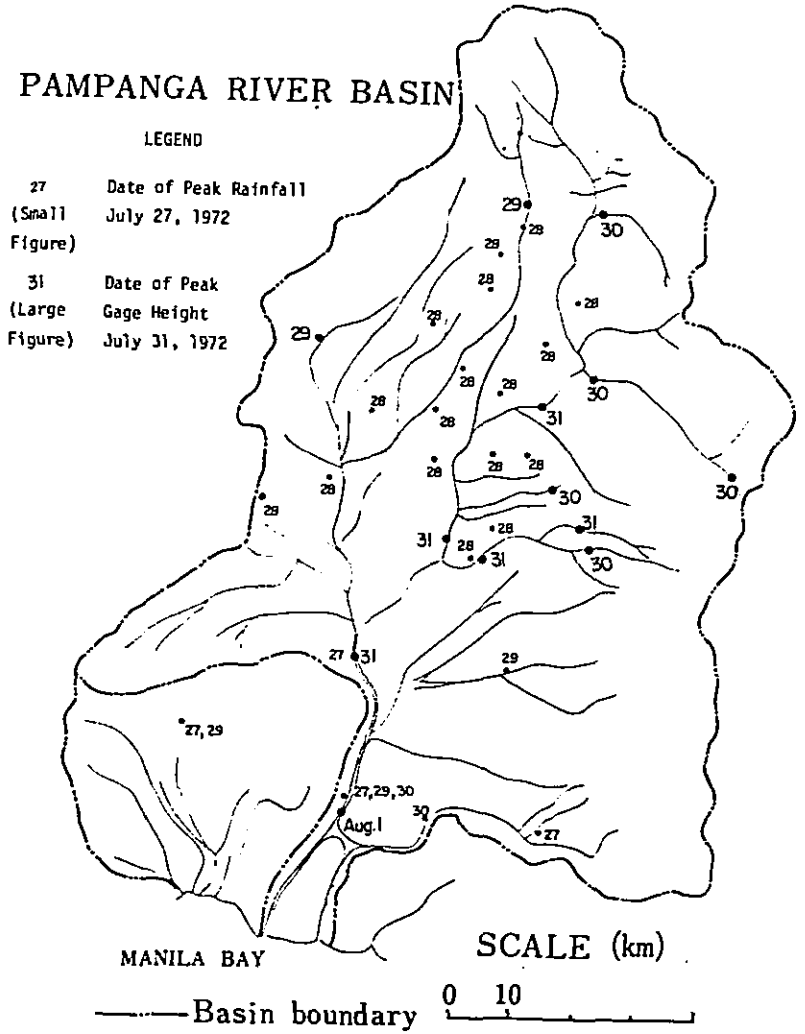


Fig. B.4.29 Date of Peak Daily Rainfall and Corresponding Peak Gage Height (2) July 1972

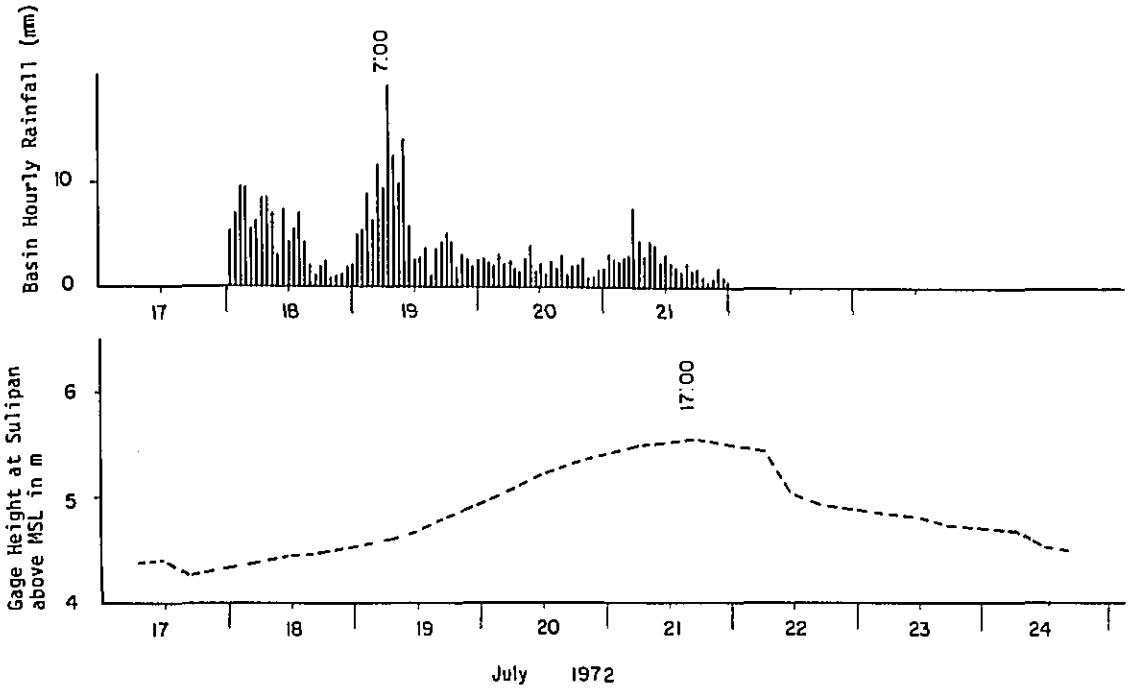


Fig. B.4.30 Hourly Gage Height at Sulipan, Apalit, with Basin Hourly Rainfall July 17-24, 1972

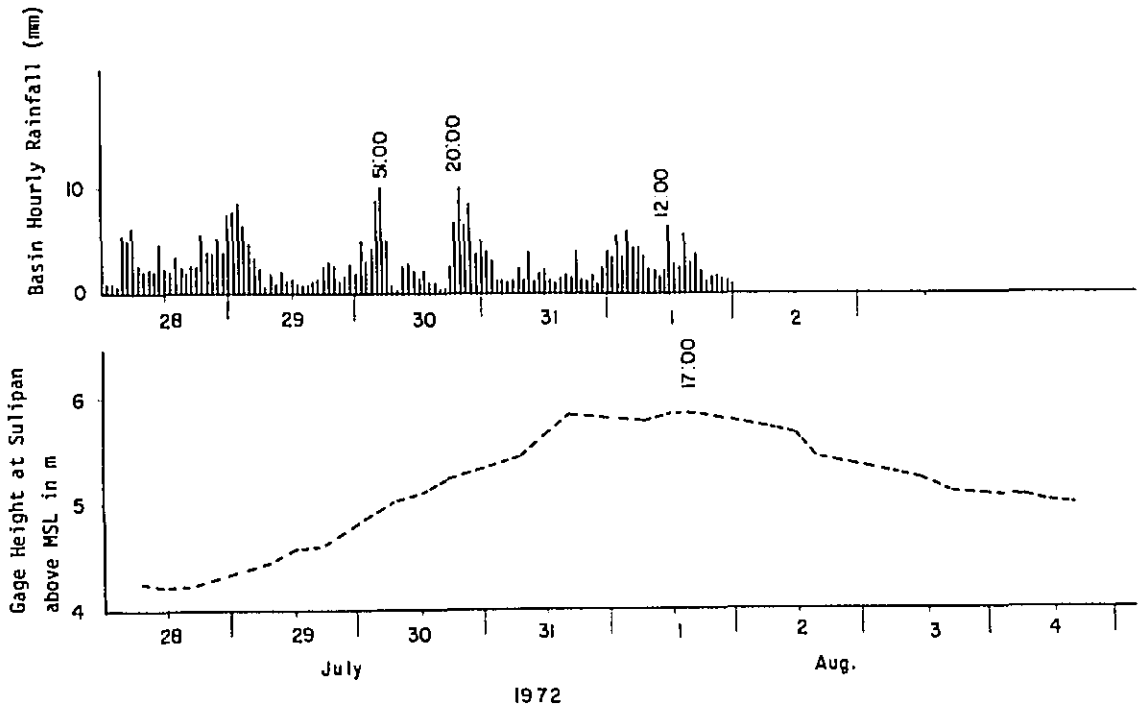


Fig. B.4.31 Hourly Gage Height at Sulipan, Apalit, with Basin Hourly Rainfall July 28 - Aug. 4, 1972

(7) Flood Record

The 1972 flood which hit the Central Luzon of the Philippines was unprecedented in its intensity and duration as well as its extent. The Pampanga, the largest river in the region, experienced a severe flood protracted for some 40 days with three significant peaks, two of which exceeded the highest ever observed.

A number of typhoons and tropical depressions occurred in the Western Pacific during the months of June, July and August 1972. Two of them, KONSING and EDENG, landed in Luzon Island and brought considerable amount of rainfall over the Central Luzon. The other typhoons and depressions, though they did not hit the island directly, intensified the Southwest monsoon in the northern parts of the Philippines and caused protracted heavy rainfall in the basin.

The rainfall spell from the end of June to end of August had three significant peaks, all in July. Most of the raingauges in the basin recorded the largest daily as well as monthly total in July, as shown in the following table.

Record of rainfall in July 1972 at selected stations in the Pampanga basin in m m

Station	Maximum Daily Rainfall	Second Maximum Daily Rainfall	Total for the month
Toyabo (Nueva Ecija)	118.6(17)*	108.7(28)*	1290.2
Bangad (Cabanatuan City)	268.2(6)	123.4(7)	1146.5
Zaragoza (Nueva Ecija)	221.8(8)	201.2(7)	1680.3
Hacienda Luisita (Tarlac)	110.0(7)	107.9(27)	1590.0
Arayat (Pampanga)	196.8(7)	149.4(18)	1456.7
Apalit (Pampanga)	280.4(18)	206.2(17)	2580.3
Baliwag (Bulacan)	170.4(18)	161.5(7)	1523.7

* Number in parenthesis indicates date of occurrence.

It is noteworthy that the rainfall was record breaking not only in its amount, but also in its intensity. Such conditions could be the cause of extra-ordinary flood in both small and large rivers.

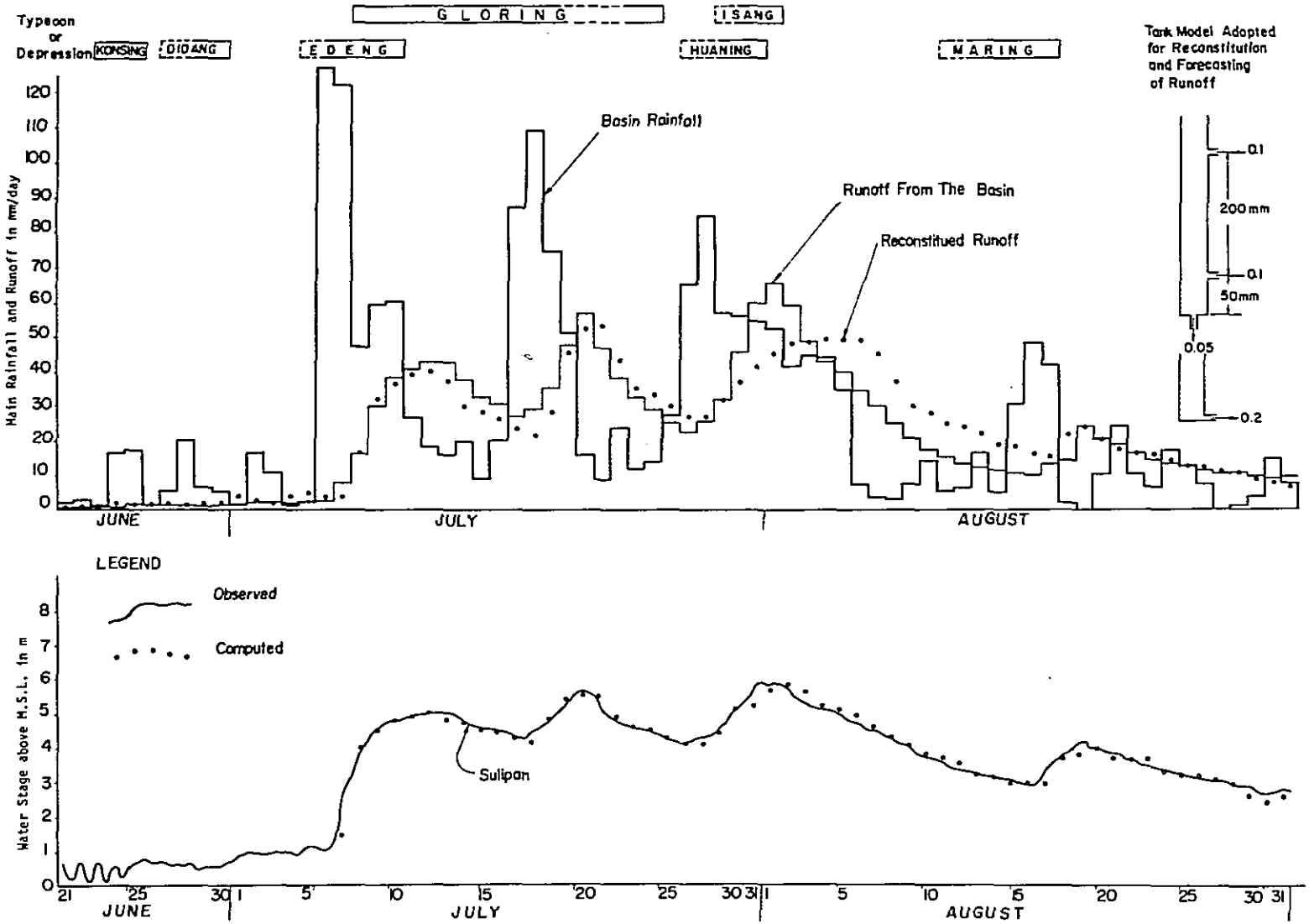


Fig. B.4.32 Computed and Observed Hybrographs at Sulipan, Apalit, with Basin Daily Rainfall June-July-Aug. 1972

(1)	Weather Record		
(2)	Thphoon Track	Fig. B.5.1	(P.170)
(3)	Rainfall		
	(i) Rainfall Station	Table A.4.5 Fig. A.4.2	(P. 14) (P. 16)
	(ii) Hourly Rainfall	Table B.5.1-10 Fig. B.5.2	(P.171) (P.176)
	(iii) Daily Rainfall (Isohyetal Map)	Table B.5.11-14 Fig. B.5.3-12	(P.177) (P.179)
	(iv) Basin Daily Rainfall	Table B.5.15	(P.184)
(4)	Gage Height		
	(i) Stream Gaging Station	Table A.4.6 Fig. A.4.3	(P. 17) (P. 19)
	(ii) River Gage Reading	Table B.5.16-21	(P.185)
	(iii) Hourly Gage Height	Table B.5.22-33 Fig. B.5.13	(P.188) (P.194)
	(iv) Mean Daily Gage Height	Table B.5.34 Fig.	(P.195) ( )
(5)	Discharge		
	(i) Stream Gaging Station	Table A.4.6 Fig. A.4.3	(P. 17) (P. 19)
	(ii) Mean Daily Discharge	Table Fig.	( ) ( )
(6)	Peak Time		
	(i) Peak Date and Time (Areal Distribution)		
	(a) Date and Time of Peak Gage Height	Table Fig.	( ) ( )
	(ii) Time Difference between Two Peaks		
	(a) Date and Time of Peak Hourly Rainfall, and that of Corresponding Peak Hourly Gage Height	Table B.5.35 Fig. B.5.14	(P.195) (P.196)
	(b) Date of Peak Daily Rainfall, and Date and Time of Corresponding Peak Hourly Gage Height	Fig. B.5.15	(P.196)
	(c) Date of Peak Daily Rainfall and Corresponding Peak Daily Gage Height	Fig.	( )
	(d) Hourly Gage Height Hydrograph with Hourly Rainfall at Sulipan, Apalit	Fig. B.5.16	(P.197)
(7)	Flood Record, Damages		( )
(8)	Flood Forecasting	Fig. B.5.17	(P.200)

(1) Weather Record

Three typhoons which affected Central Luzon in October 1973 provided the first opportunity to test the effectiveness of the flood forecasting system. The reconstructed tracks of the typhoons are shown in Fig. B.5.1.

① Typhoon Luming (October 2 - 9, 1973)

This tropical disturbance developed from a broad low pressure area southeast of Yap on September 30 and reached typhoon intensity on October 4. It started moving westward at 23 KPH on October 6 but veered northwestward and passed within 40 KM off the eastern coast of Isabela in the evening of October 7.

The typhoon passed over the northeastern portion of Cagayan in the morning of October 8 and crossed the Babuyan and Balintang Channel in the evening of the same day.

The accumulated areal rainfall over the basin from 8 pm of October 7 up to noon of October 10 was 155.8 mm. A maximum 3-hour basin rainfall of 18.8 mm. was recorded at 2 pm of October 9.

② Typhoon Miling (October 9 - 12, 1973)

This disturbance took a west-northwesterly course up to October 11 when it slowed down and then moved northwest towards northern Luzon. It weakened rapidly upon reaching land on October 12.

An average areal rainfall of 25.8 mm. fell over the basin during a 9-hour period from 2 pm of October 11.

③ Typhoon Narsing (October 12 - 17, 1973)

This typhoon entered the Philippine area of responsibility at 8 pm of October 12 and followed a westnorthwesterly or westerly course towards Luzon at speeds varying from 28 KPH to 19 KPH. The typhoon cut across Central Luzon during the night of October 15 and early morning of October 16. It entered Luzon over the Southern part of Baler, Quezon, hit Pantabangan, Nueva Ecija at around midnight of October 15, moved towards Dagupan City, Pangasinan and then followed a westerly track out into the China Sea.

The typhoon passage over Central Luzon was associated with flood-producing rainfall of unusually high intensity over the Pampanga River Basin. This is illustrated by the following rainfall data obtained from the records of the telemetering system:

a. Basin rainfall on October 14-16 (54 hours) ..... 254.0 mm.

b. Maximum 24-hour basin rainfall on Oct. 15 ..... 208.4 mm.

c. Maximum 3-hour basin rainfall on Oct. 16 ..... 50.0 mm.

The rainfall from the first two typhoons did not result in overflowing of water in the river channels. It seems likely that with the initially low moisture content of the basin, a significant amount of rain from the two typhoons infiltrated into the soil thus limiting the runoff to the streams. By the time Typhoon Narsing crossed Central Luzon the soil was possibly near saturation and this resulted in very high runoff from the very intense and excessive rainfall.

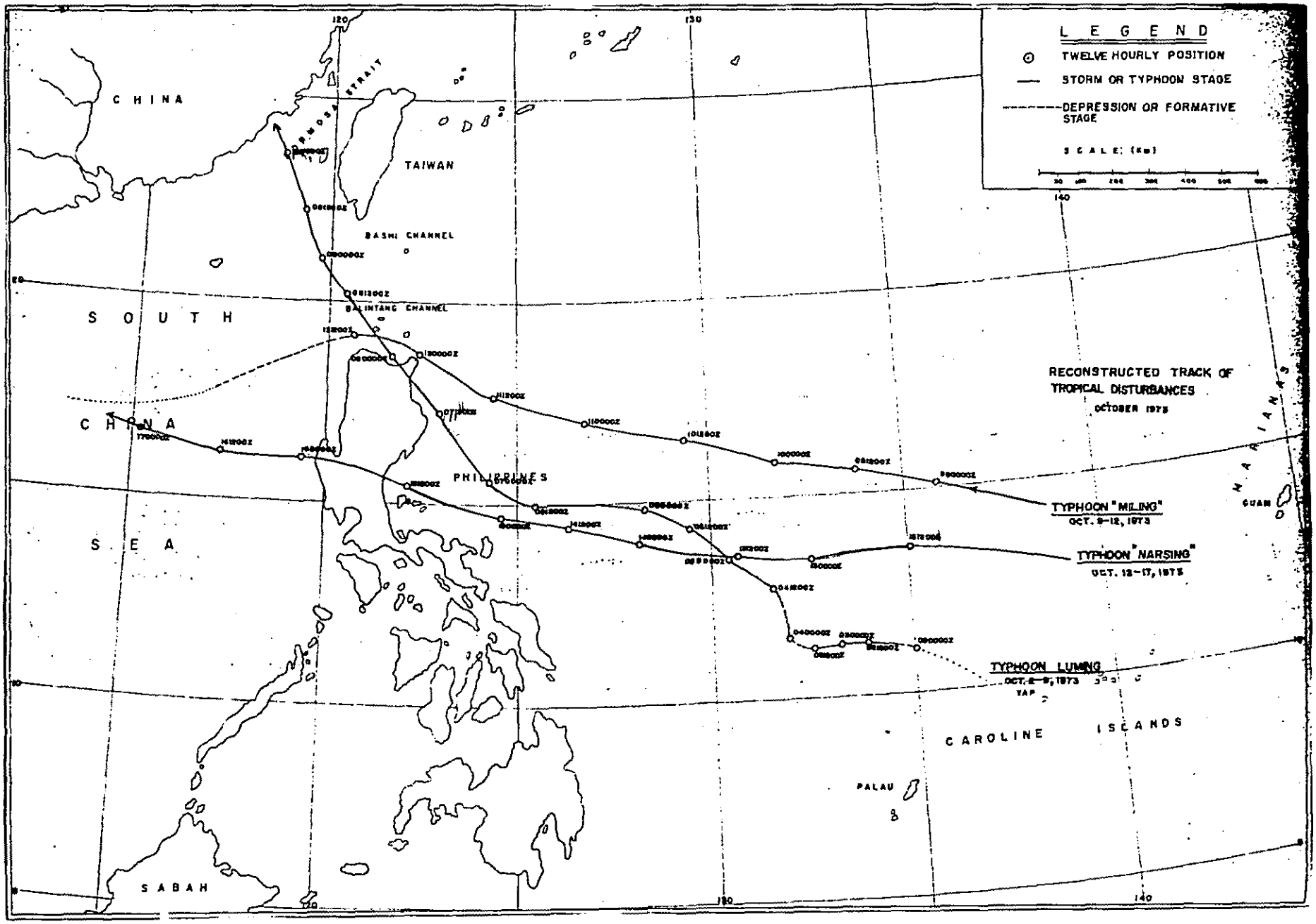


Fig. B.5.1 Typhoon Track Oct. 1973

Table B.5.2 Hourly Rainfall Oct. 7, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Oct. 7 1973

No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0 – 1	.	4.	4.	3.	2.	2.	2.	1.	2.	1.	5.8
2	.	23.	1.	.	.	1.	.	1.	.	.	5.2
3	.	13.	3.	1.	1.	4.	3.	3.	3.	1.	7.
4	.	4.	3.	2.	1.	1.	1.	2.	.	1.	4.6
5	.	1.	.	.	.	.	1.	1.	1.	1.	1.2
6	.	3.	3.	2.	.	2.	.	2.	1.	1.	5.2
7	.	1.	.	1.	.	1.	1.	1.	.	.	1.7
8	.	.	.	.	1.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	1.	.	.	.	.	.	.	.	.	0.5
12	.	.	.	.	.	.	.	.	.	.	1.
13	.	.	.	.	.	.	.	.	.	.	0.5
14	.	.	.	.	.	.	.	.	.	1.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	1.	.	.	.	.	1.	.	.	.
17	.	.	.	.	.	.	.	4.	1.	1.	.
18	.	.	.	.	1.	.	2.	2.	3.	2.	.
19	.	1.	.	.	2.	5.	2.	.	3.	4.	.
20	.	.	.	.	1.	.	.	2.	2.	2.	.
21	.	.	.	1.	1.	1.	2.	1.	2.	3.	2.
22	.	1.	1.	.	3.	3.	1.	2.	2.	2.	.
23	.	1.	1.	2.	2.	1.	2.	4.	2.	3.	.
23–24	.	1.	3.	4.	2.	3.	4.	4.	2.	1.	1.5
Total	.	54.	20.	16.	17.	24.	21.	31.	24.	24.	36.2
18–9	.	36.	40.	56.	19.	29.	20.	36.	24.	10.	.

Table B.5.1 Hourly Rainfall Oct. 6, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Oct 6 1973

No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0 – 1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.
21	.	1.	.	.	.	1.	.	2.	.	.	.
22	.	4.	2.	.	.	1.	1.	2.	1.	1.	.
23	.	4.	2.	2.	1.	3.	1.	3.	3.	1.	.
23–24	.	10.	6.	6.	2.	5.	3.	4.	3.	2.	8.1
Total	.	19.	10.	8.	3.	10.	5.	11.	7.	4.	8.1
18–9	.	68.	24.	17.	8.	21.	13.	22.	14.	9.	.

Table B.5.4 Hourly Rainfall Oct. 9, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Oct. 9 1973

No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0–1	2.	5.	3.	1.	2.	4.	2.	3.	2.	1.	3.1
2	1.	2.	.	.	.	1.	1.	1.	2.	3.	1.
3	.	1.	5.	1.	4.	1.	1.	2.	.	.	.
4	.	1.	1.	.	.	.	.	.	.	.	8.4
5	.	1.	.	.	.	.	.	.	1.	1.	.
6	.	.	.	.	.	1.	.	.	.	.	.
7	.	1.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	1.	.	.	.	.	2.	.
9	.	1.	2.	1.	10.	14.	10.	.	3.	10.	.
10	.	7.	8.	1.	11.	6.	6.	4.	7.	8.	24
11	.	9.	7.	4.	2.	7.	2.	9.	4.	3.	23.2
12	.	2.	1.	.	.	1.	.	2.	1.	1.	1.5
13	.	.	.	.	.	.	.	.	.	.	0.5
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	1.	1.	.	.	.	.	.	.
17	.	.	1.	.	1.	.	5.	.	.	.	1.
18	1.	1.	.	.	.	1.	.	.	.	.	0.5
19	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	1.	.	.	.	.	.	.	.
23–24	.	.	.	1.	.	.	.	.	.	.	.
Total	4.	29.	28.	11.	32.	36.	27.	21.	30.	29.	41.6
19–8	1.	18.	19.	9.	25.	29.	23.	15.	15.	22.	.

Table B.5.3 Hourly Rainfall Oct. 8, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Oct. 8 1973

No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0–1	.	2.	4.	2.	1.	1.	.	2.	.	.	1.5
2	.	4.	4.	4.	.	2.	.	.	1.	.	3.6
3	.	3.	2.	9.	1.	6.	4.	2.	4.	20.	5.1
4	.	2.	3.	6.	.	1.	.	4.	.	.	4.1
5	.	7.	4.	15.	1.	2.	.	2.	2.	.	18.9
6	.	8.	14.	8.	4.	3.	3.	3.	1.	1.	8.2
7	.	4.	3.	3.	.	1.	.	1.	1.	.	5.6
8	.	1.	.	2.	.	1.	.	1.	.	.	2.
9	.	2.	3.	5.	4.	3.	4.	.	6.	4.	2.6
10	.	4.	4.	2.	2.	1.	.	4.	1.	1.	5.2
11	.	3.	12.	3.	4.	3.	1.	1.	4.	7.	5.2
12	.	9.	5.	8.	2.	2.	1.	1.	.	1.	11.
13	.	10.	14.	7.	9.	9.	6.	1.	6.	11.	10.
14	.	8.	3.	3.	2.	8.	1.	3.	10.	5.	16.8
15	.	6.	3.	1.	3.	1.	1.	47.	3.	2.	1.
16	1.	7.	1.	2.	.	1.	.	36.	1.	1.	3.7
17	1.	5.	1.	.	7.	2.	5.	34.	7.	12.	0.5
18	2.	6.	3.	1.	2.	11.	1.	16.	2.	2.	2.6
19	1.	2.	.	.	.	.	.	.	.	.	0.5
20	.	.	.	.	.	.	.	3.	.	.	0.5
21	.	.	.	.	.	.	.	2.	.	.	.
22	3.	.	1.	3.	.	.	2.	.	2.	1.	0.5
23	7.	9.	10.	3.	12.	14.	29.	2.	2.	16.	13.6
23–24	1.	10.	3.	2.	4.	12.	5.	5.	4.	5.	1.
Total	16.	112.	97.	89.	58.	84.	63.	170.	57.	89.	123.7
19–8	19.	82.	72.	42.	58.	75.	60.	159.	53.	75.	.

Table B.5.6 Hourly Rainfall Oct. 14, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Oct. 14 1973

No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0-1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	1.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	1.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	7.	.	1.	.
18	.	.	1.	.	.	.	.	1.	.	.	.
19	.	.	1.	.	.	8.	1.	.	16.	9.	.
20	.	.	.	.	.	1.	.	1.	16.	.	.
21	.	.	.	.	.	.	.	1.	.	1.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
23-24	.	.	.	.	.	.	.	.	.	.	.
Total	1.	.	2.	1.	.	9.	1.	10.	32.	11.	.
(0-9)	5.	5.	2.	1.	.	13.	2.	18.	34.	11.	.

Table B.5.5 Hourly Rainfall Oct. 10, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Oct. 10 1973

No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0-1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	1.	1.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	0.5
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
23-24	.	.	.	.	.	.	.	.	.	.	.
Total	.	.	1.	1.	.	.	.	.	.	.	0.5
(0-9)	.	.	1.	1.	.	.	.	.	.	.	.

Table B.5.8 Hourly Rainfall Oct. 16, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — Oct. 16 1973

No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0–1	23·	11·	9·	59	8·	16·	9·	9·	18	13·	63·6
2	8·	9·	13·	13·	12·	18	10·	27	36·	10·	8·2
3	10	23·	10	10	11·	44	6·	28	18	23·	15·4
4	12	16·	5·	8	6·	18	10·	14·	22	9·	5·6
5	9·	16·	5·	3·	13·	18	3·	10·	12·	16·	6·1
6	8·	9·	28·	7·	16·	6·	11·	7·	10·	10·	11·8
7	6·	9·	22·	24	23·	7·	11·	8·	9·	36·	11·3
8	5·	6·	12·	16·	23·	4·	13·	4·	5·	10·	11·8
9	4·	6·	7·	2·	6·	6·	7·	3·	5·	13·	2·6
10	2·	2·	2·	6·	9·	4·	2·	1·	2·	17·	4·2
11	·	1·	3·	14·	7·	·	2·	3·	4·	2·	2·1
12	5·	1·	·	·	·	·	·	·	·	·	0·5
13	·	·	·	·	·	·	·	·	·	·	·
14	·	·	·	4·	3·	·	1·	·	·	4·	·
15	·	·	·	3·	4·	·	1·	·	·	11·	·
16	·	·	1·	3·	3·	·	·	·	·	1·	0·5
17	·	·	·	1·	·	·	·	·	·	·	·
18	·	·	·	·	·	·	·	·	·	·	·
19	·	·	·	·	·	·	·	·	·	·	·
20	·	·	·	·	·	·	·	·	·	·	·
21	·	·	·	·	·	·	·	·	·	·	·
22	·	·	·	·	·	·	·	·	·	·	·
23	·	·	·	·	·	·	·	·	·	·	·
23–24	·	·	·	·	·	·	·	·	·	·	·
Total	92	119	117	173	144	141	86	118	141	175	193·7
0–8	11·	10·	13·	33·	32·	10·	13·	7·	11·	48·	·

Table B.5.7 Hourly Rainfall Oct. 15, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — Oct. 15 1973

No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0–1	2·	·	·	·	·	·	·	·	·	·	·
2	·	·	·	·	·	·	·	·	·	·	·
3	·	1·	·	·	·	·	·	·	·	·	·
4	·	·	·	·	·	·	·	·	·	·	·
5	·	·	·	·	·	·	·	·	·	·	·
6	·	0·	·	·	·	·	·	·	·	·	·
7	1·	·	·	·	·	·	·	·	·	·	·
8	1·	·	·	·	·	1·	1·	·	·	·	·
9	3·	4·	1·	·	1·	1·	·	1·	1·	·	2·
10	1·	·	3·	1·	3·	4·	7·	5·	1·	3·	1·
11	4·	·	9·	1·	2·	3·	27·	·	3·	5·	2·
12	19·	42·	14·	2·	8·	13·	14·	5·	16·	4·	8·2
13	3·	·	7·	3·	8·	3·	16·	7·	8·	7·	16·4
14	3·	·	5·	11·	5·	6·	·	8·	3·	2·	3·6
15	23·	13·	9·	4·	5·	4·	5·	1·	2·	1·	11·8
16	11·	·	17·	5·	8·	12·	5·	14·	8·	4·	30·8
17	2·	·	4·	·	2·	7·	7·	4·	4·	9·	1·
18	2·	19·	1·	1·	1·	1·	1·	3·	2·	2·	2·
19	3·	·	1·	1·	·	4·	1·	3·	3·	·	1·5
20	6·	·	4·	1·	2·	5·	3·	7·	3·	4·	2·
21	5·	15·	4·	1·	4·	8·	4·	7·	5·	3·	2·5
22	1·	·	1·	·	1·	6·	2·	7·	3·	2·	2·5
23	7·	·	9·	1·	2·	9·	2·	13·	7·	4·	4·6
23–24	35·	73·	26·	26·	3·	14·	3·	15·	10·	7·	8·4
Total	132·	172·	115·	59·	55·	104·	98·	100·	81·	57·	176·3
0–8	209·	226	219·	198·	167·	231·	170·	207·	209·	184·	·

Table B.5.10 Hourly Rainfall Oct. 18, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Oct. 18 1973

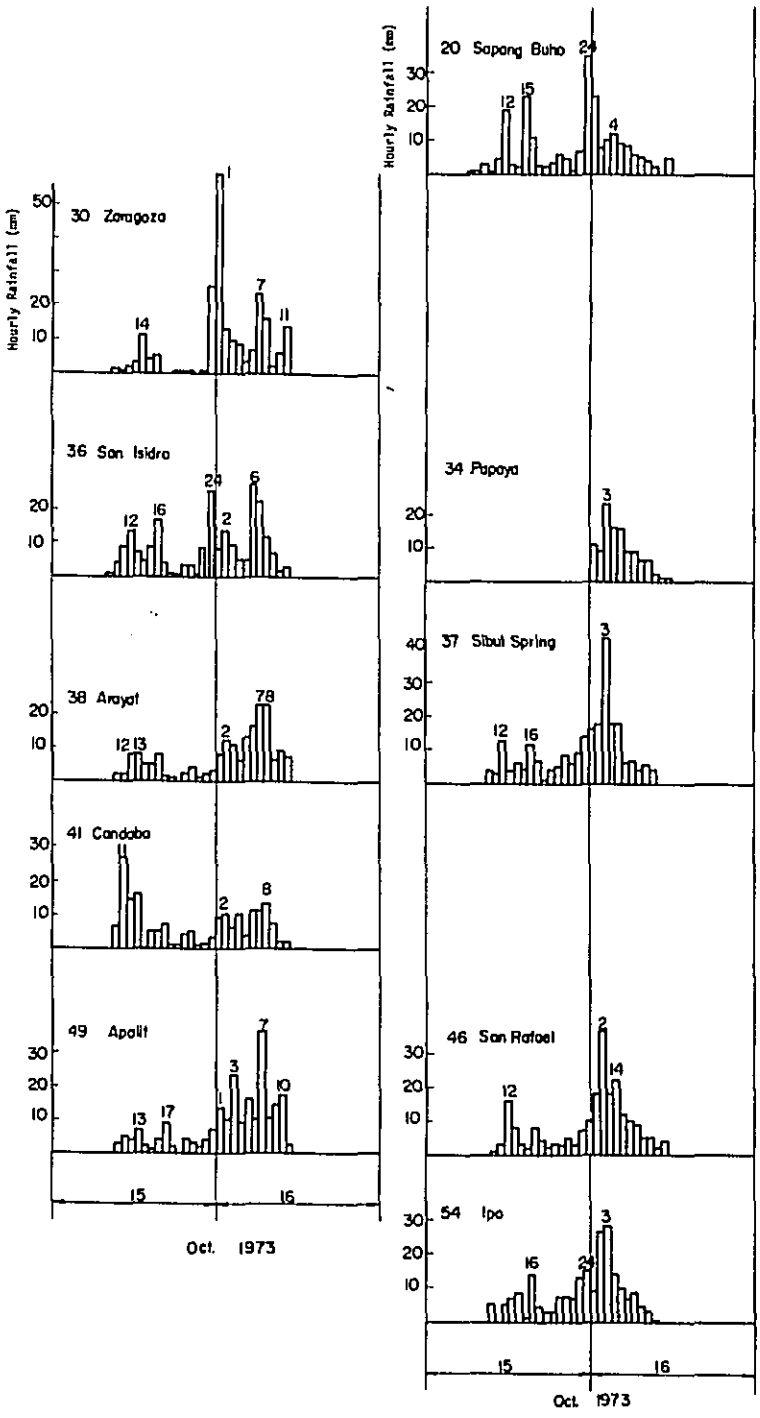
No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0 – 1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	2.	.	.	3.	.	.
23	.	.	.	.	.	.	3.	.	1.	3.	.
23–24	.	.	.	.	.	.	.	.	.	.	.
Total	.	.	.	.	.	2.	3.	.	4.	3.	.
18–9	.	.	.	.	.	2.	3.	.	4.	.	.

Table B.5.9 Hourly Rainfall Oct. 17, 1973

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Oct. 17 1973

No.	20	34	36	30	38	37	41	54	46	49	26
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Cabanatuan
0 – 1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	4.	.	.	.	.	.
15	.	1.	.	.	.	2.	.	.	.	.	.
16	.	.	4.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	0.5
20	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
23–24	.	.	.	.	.	.	.	.	.	.	.
Total	.	1.	4.	.	.	6.	.	.	.	.	0.5
18–9	.	1.	4.	.	.	6.	.	.	.	.	.



	20 Sapang Buho
30 Zaragoza	
36 San Isidro	34 Papaya
38 Arayat	37 Sibul Spring
41 Candaba	
49 Apalit	46 San Rafael
	54 Ipo

Fig. B.5.2 Hourly Rainfall Oct. 15-16, 1973

Table B.5.12 Daily Rainfall (2) Oct. 4-22, 1973

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga

Oct. 19 73

No.	19	20	21	23	24	25	26	27	28	29	30	32	33
Day / Gage Station	Flanlian Gen. Natividad	Sapang Ruhn	Hurcom Dam	Bantung	Quezon	Pamaldan Cinco-Cinco	Cabanatuan City	Bongod	Zaragoza	Cabaldon	Zaragoza	Lambakin Jaen	Hallorca San Leonardo
1	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	3.	.	1.	.
5	.	.	6.	.	.	.	.	.	.	.	.	15.	2.
6	64.	50.	41.	30.	22.	30.	39.	56.	21.	100.	16.	22.	33.
7	53	44.	45.	47.	42.	48.	52.	43.	38	73.	49.	35.	36.
8	26.	75.	49.	39.	47.	60.	87.	85.	69	23.	40.	79.	76.
9	.	15.	18.	16.	9.	25.	28	29.	17.	.	11.	23.	18.
10	.	1.	1.	2.	.	1.	1.	.	.	.	.	1.	.
11	2.	7.	8.	5.	12.	5.	5.	5.	20.	14.	20.	57.	25.
12	.	.	.	.	.	1.	.	.	.	.	1.	.	.
13	.	26.	16.	23.	6.	24.	51.	82.	8.	1.	3.	37.	49.
14	.	4.	2.	.	.	4.	.	.	.	20.	3.	4.	5.
15	240	207.	236.	221.	269.	250	330.	225.	164.	318	197.	249.	205.
16	4.	13.	5.	2.	.	.	.	.	8.	2.	36.	.	8.
17	.	.	.	.	.	.	.	.	.	.	.	.	5.
18	.	.	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	427.	440	427.	385.	407.	448	593	525	325.	546	376.	523.	459

Table B.5.11 Daily Rainfall (1) Oct. 4-22, 1973

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga

Oct. 1973

No.	1	6	7	8	9	10	11	12	13	14	15	16	17
Day / Gage Station	Baguio City	Consuelo Sta. Fe.	Dagupan City	Rosales	Casiling	Pantabangan Dam	TRIS Dam Tayabo	Cunanactan San Jose City	Baler	Tondod San Jose City	PRIS Dam	Palac Sto. Domingo	LTRIS Dam
1	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	13.	2.	.	.	.	.
5	.	.	.	.	4.	4.	.	.	.	.	.	11.	.
6	23.	24.	12.	14.	9.	33.	24.	25.	37.	30.	36.	26.	32.
7	383	160.	70.	69.	45.	41.	63.	42.	2.	42.	40.	40.	34.
8	186	87.	33.	33.	30.	53.	79.	63.	34.	38.	53.	54.	51.
9	32.	3.	7.	6.	2.	11.	15.	10.	6.	11.	18.	10.	9.
10	.	.	.	.	6.	2.	3.	.	2.	4.	1.	.	3.
11	20.	15.	15.	15.	8.	13.	6.	8.	2.	17.	15.	9.	17.
12	6.	.	.	.	14.	.	1.	.	.	.	.	.	.
13	7.	22.	31.	30.	2.	12.	22.	33.	.	18.	30.	10.	24.
14	4.	5.	.	.	.	1.	2.	3.	13.	3.	3.	1.	.
15	54.	166	65.	77.	100.	207.	96.	127.	229	137.	152.	186.	133.
16	73.	17.	20.	27.	22.	9.	14.	7.	89	6.	10.	13.	2.
17	.	.	.	.	.	.	.	.	86	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	788.	499.	253.	271.	252.	386.	375.	331.	460.	304.	356.	360.	305.

Table B.5.14 Daily Rainfall (4) Oct. 4-22, 1973

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — Oct. 1973

No.	50	51	54	56	58	60	61	62	63	64			
Day \ Gaging Station	Malinbang Railway	San Lorenza	Ipo	Malolos	Bocol Balagtas	Minuyan	Infanta	Obando	Science Garden	WB Met Ars Manila			
1	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	1.	2.	.	7.	41.	.	12.	38.	.	.	.
5	.	.	.	3.	.	.	1.	6.	.	.	.	.	.
6	6.	18.	21.	36.	.	17.	15.	8.	12.	6.	.	.	.
7	38.	48.	35.	62.	38.	29.	21.	22.	49.	25.	.	.	.
8	69.	186.	161.	69.	82.	156.	10.	3.	40.	20.	.	.	.
9	.	16.	15.	14.	18.	20.	.	.	7.	9.	.	.	.
10	.	.	.	4.	.	.	.	.	.	18.	.	.	.
11	98.	20.	63.	65.	83.	73.	1.	.	32.	.	.	.	.
12	.	77.	12.	2.	.	5.	.	.	1.	.	.	.	.
13	4.	.	5.	51.	5.	.	5.	5.	.	.	.	.	.
14	40.	8.	10.	6.	5.	29.	6.	10.	2.	6.	.	.	.
15	215.	209.	198.	116.	157.	217.	96.	3.	110.	91.	.	.	.
16	23.	6.	9.	1.	8.	14.	3.	.	9.	24.	.	.	.
17	.	.	.	.	.	.	3.	2.	.	.	.	.	.
18	.	.	.	.	.	.	.	1.	.	.	.	.	.
19	.	.	.	.	.	.	2.	.	.	.	.	.	.
20	.	.	.	.	.	.	10.	.	.	.	.	.	.
21	.	.	.	.	.	.	1.	.	15.	6.	.	.	.
22	.	.	.	.	.	.	.	.	4.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.	.
Tota	473.	588.	530.	432.	436.	587.	215.	60.	293.	239.	.	.	.

Table B.5.13 Daily Rainfall (3) Oct. 4-22, 1973

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — Oct. 1973

No.	34	36	37	38	39	40	41	43	45	46	47	48	49
Day \ Gaging Station	Papaya	San Ildidro	Sibul Spring	Arayat	San Agustin Arayat	San Miguel Bulacan	Candaba	Sta. Cruz Porac	Bacolor	San Rafael	Sahang	Apalit	Sulipan Apalit
1	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	1.	2.	1.	.
5	.	29.	.	.	.	8.	8.	2.	1.	.	14.	.	.
6	68.	20.	19.	6.	10.	.	14.	9.	8.	14.	.	11.	12.
7	36.	36.	28.	27.	26.	63.	20.	21.	38.	26.	31.	39.	40.
8	91.	69.	70.	60.	63.	95.	61.	84.	61.	53.	81.	30.	91.
9	19.	19.	29.	18.	27.	43.	23.	17.	23.	15.	23.	15.	4.
10	.	1.	.	.	.	.	.	1.	.	.	.	.	.
11	34.	38.	23.	25.	20.	18.	25.	18.	56.	70.	93.	81.	81.
12	.	.	2.	4.	1.	47.	5.	1.	.	1.	2.	.	5.
13	61.	30.	44.	14.	16.	21.	22.	10.	.	1.	2.	4.	2.
14	2.	2.	13.	.	1.	50.	2.	27.	15.	36.	31.	11.	2.
15	285.	210.	221.	158.	190.	126.	168.	122.	121.	209.	257.	150.	195.
16	13.	13.	10.	43.	32.	127.	13.	32.	57.	11.	21.	28.	48.
17	.	4.	6.	.	.	.	.	.	.	.	.	.	.
18	.	.	2.	.	.	.	3.	.	.	9.	9.	14.	.
19	.	.	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	1.	.	.	12.	15.	13.	.
21	.	.	.	.	.	.	.	.	.	.	1.	.	.
22	.	.	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.	.
Tota	609.	471.	467.	353.	386.	597.	361.	365.	380.	456.	582.	395.	486.

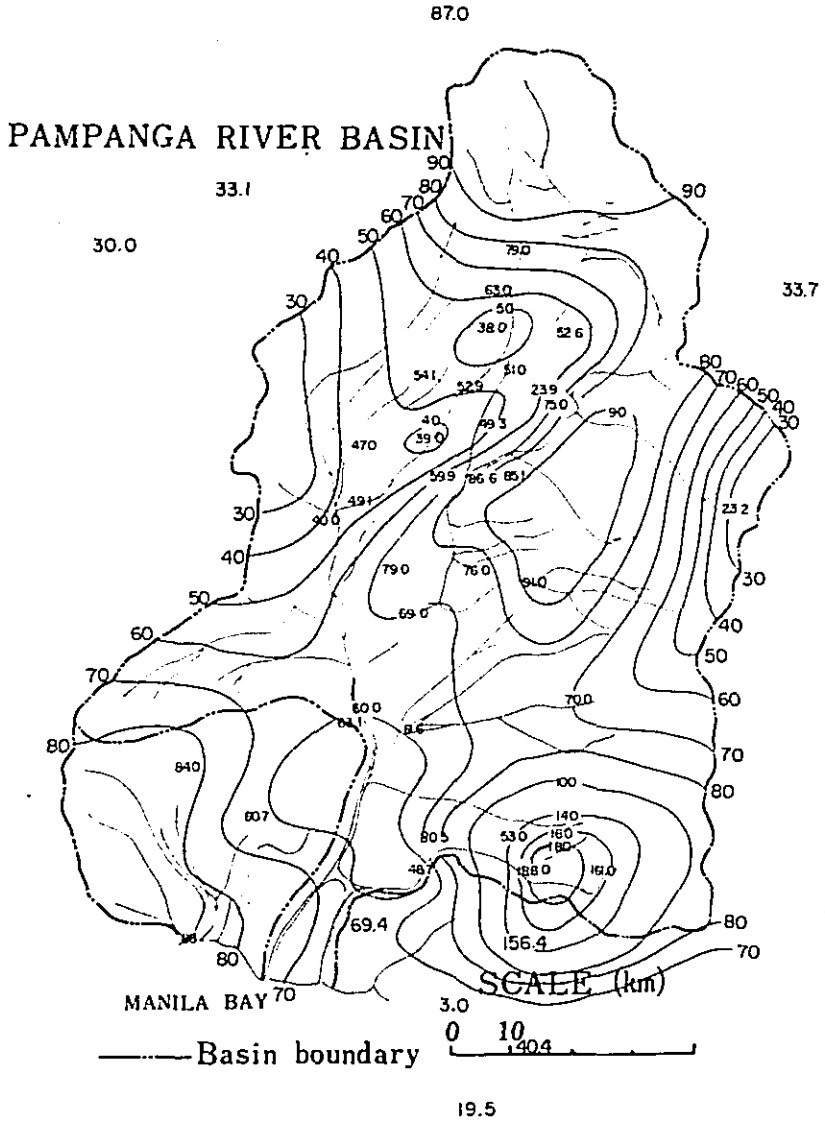


Fig. B.5.4 Isohyetal Map Oct. 8, 1973

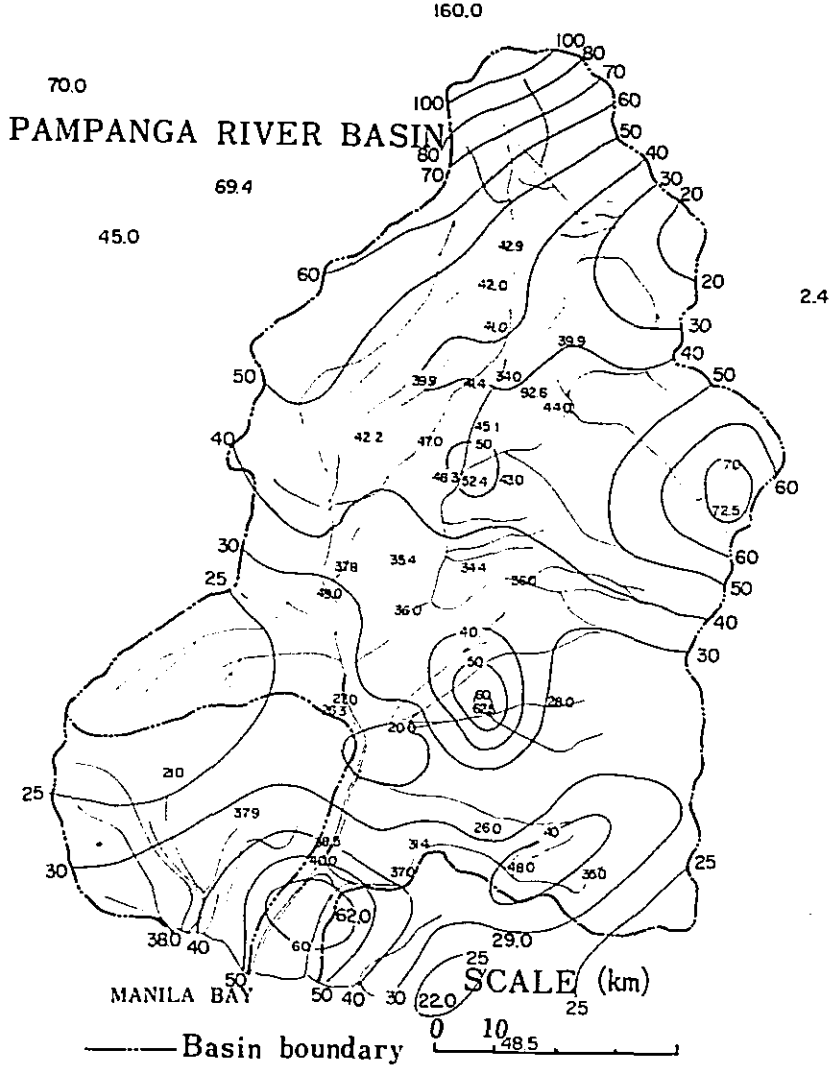


Fig. B.5.3 Isohyetal Map Oct. 7, 1973

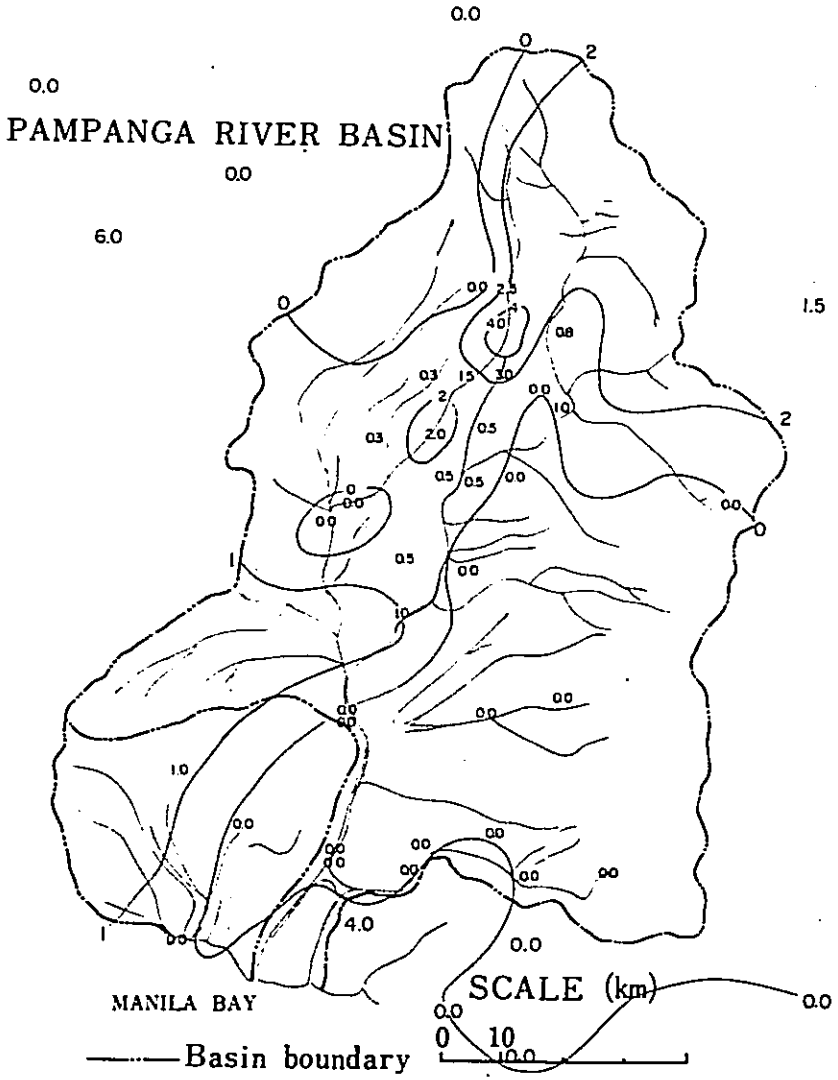


Fig. B.5.6 Isohyetal Map Oct. 10, 1973

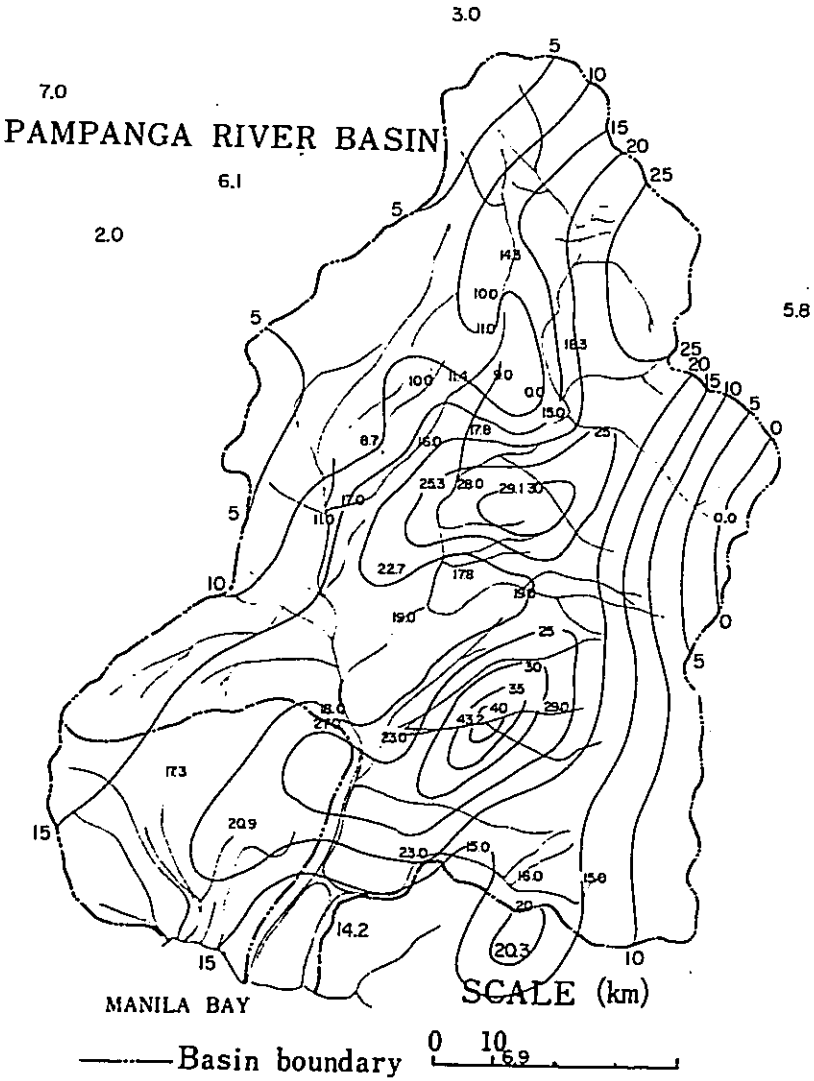


Fig. B.5.5 Isohyetal Map Oct. 9, 1973

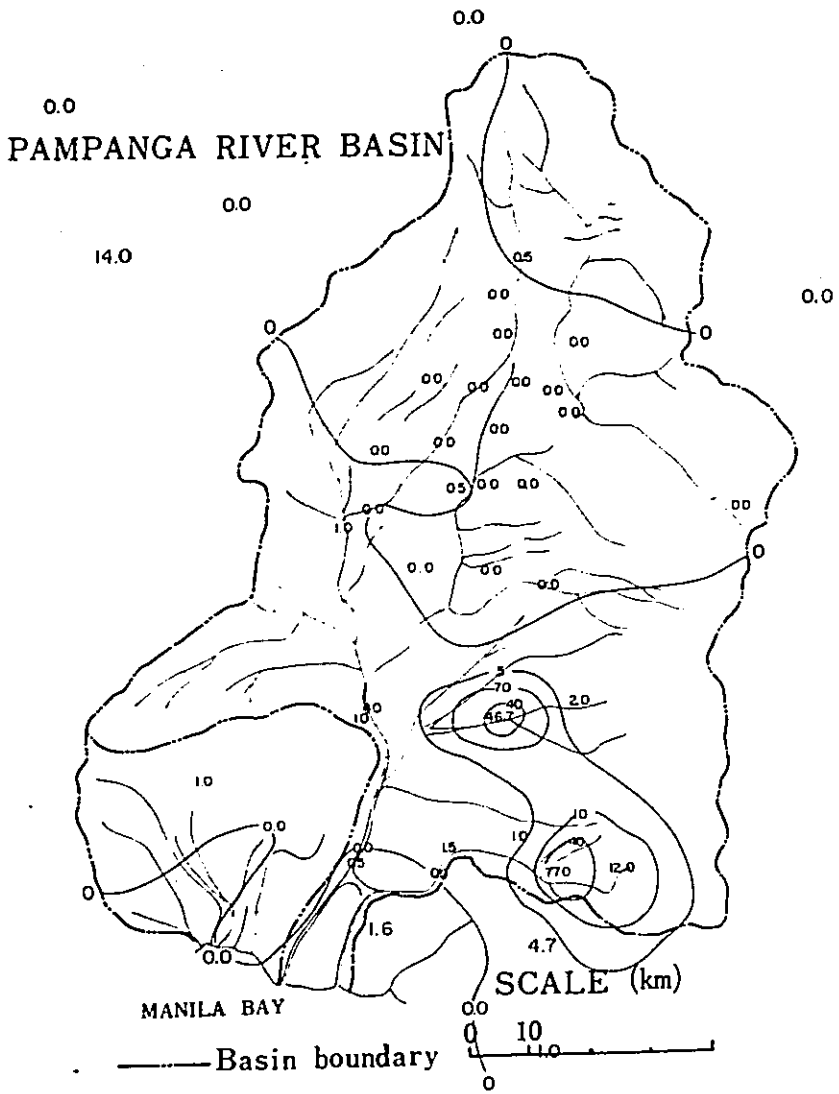


Fig. B.5.8 Isohyetal Map Oct. 12, 1973

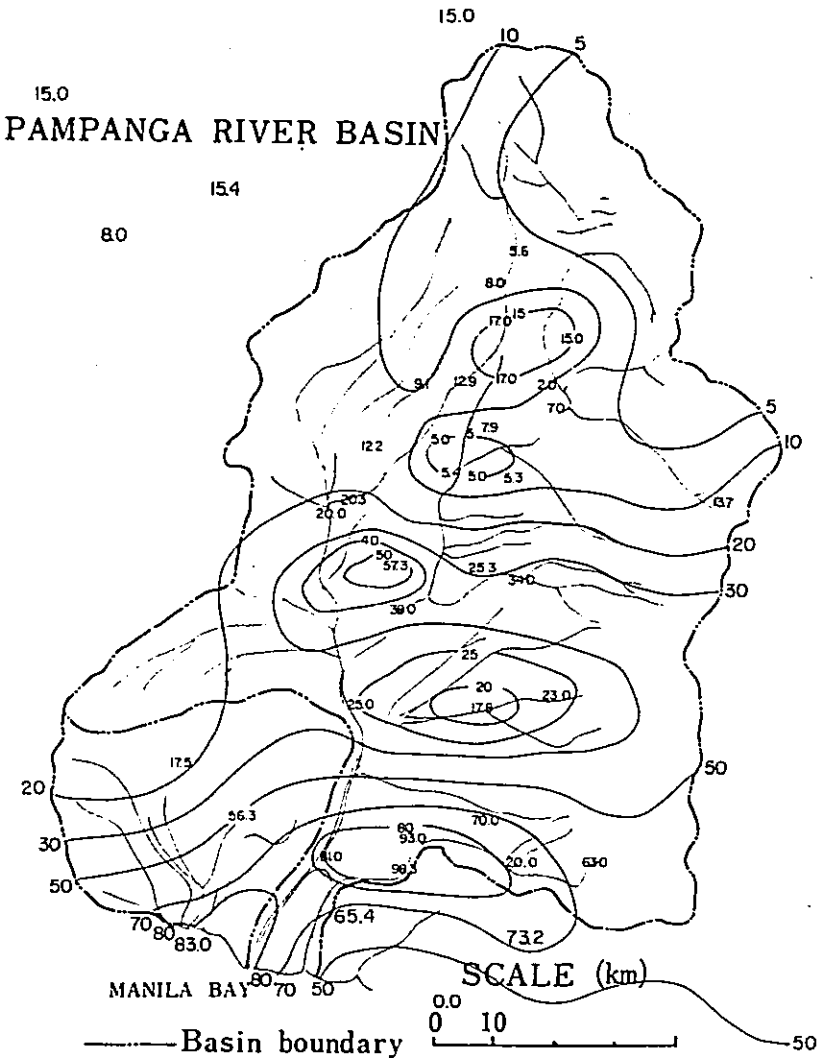


Fig. B.5.7 Isohyetal Map Oct. 11, 1973

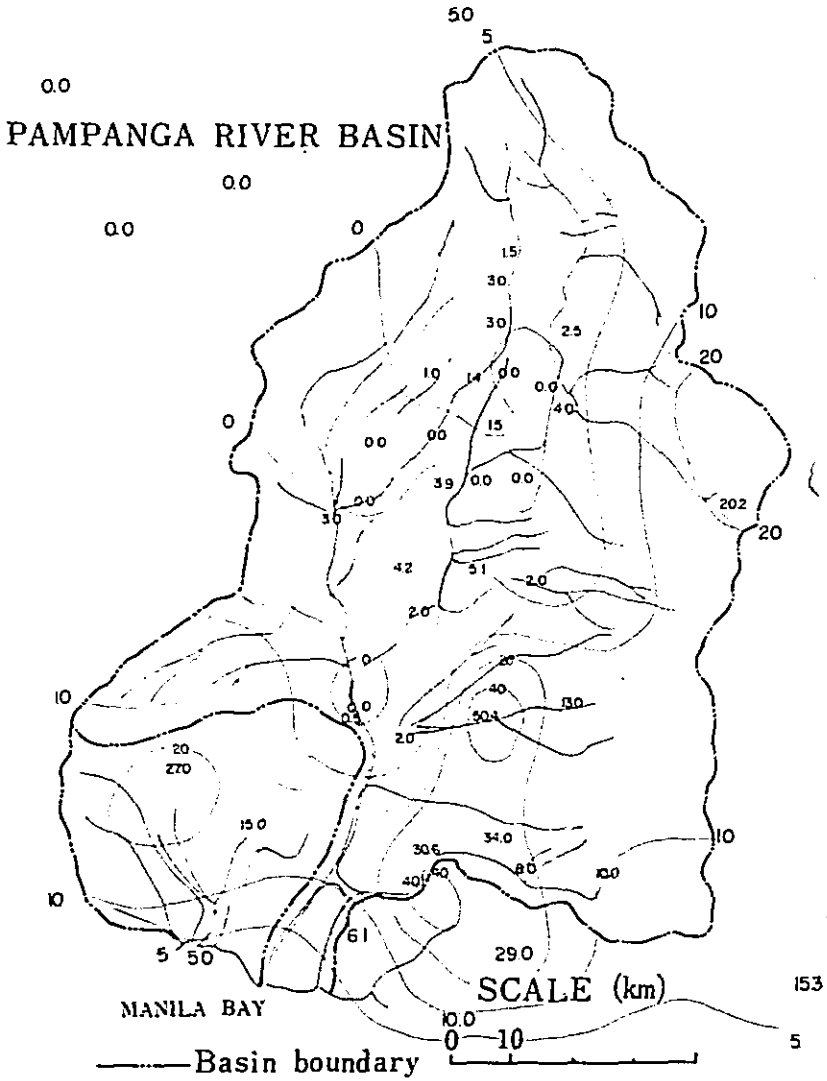


Fig. B.5.10 Isohyetal Map Oct. 14, 1973

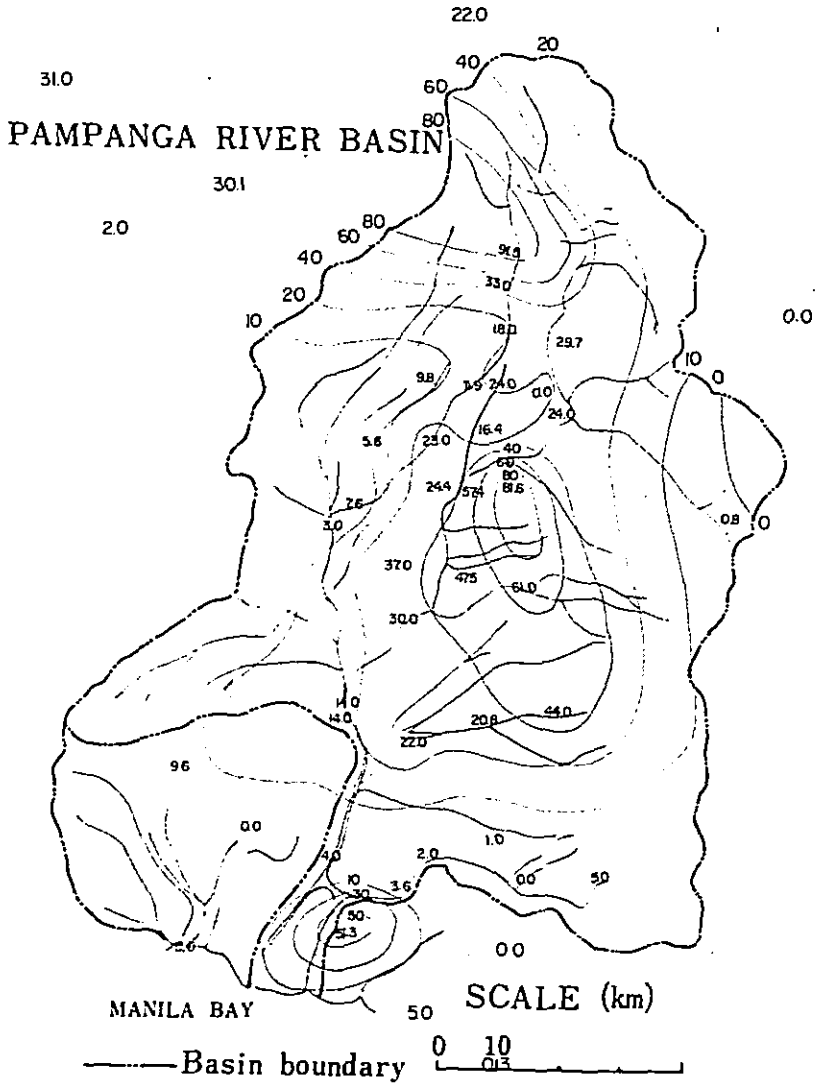


Fig. B.5.9 Isohyetal Map Oct. 13, 1973

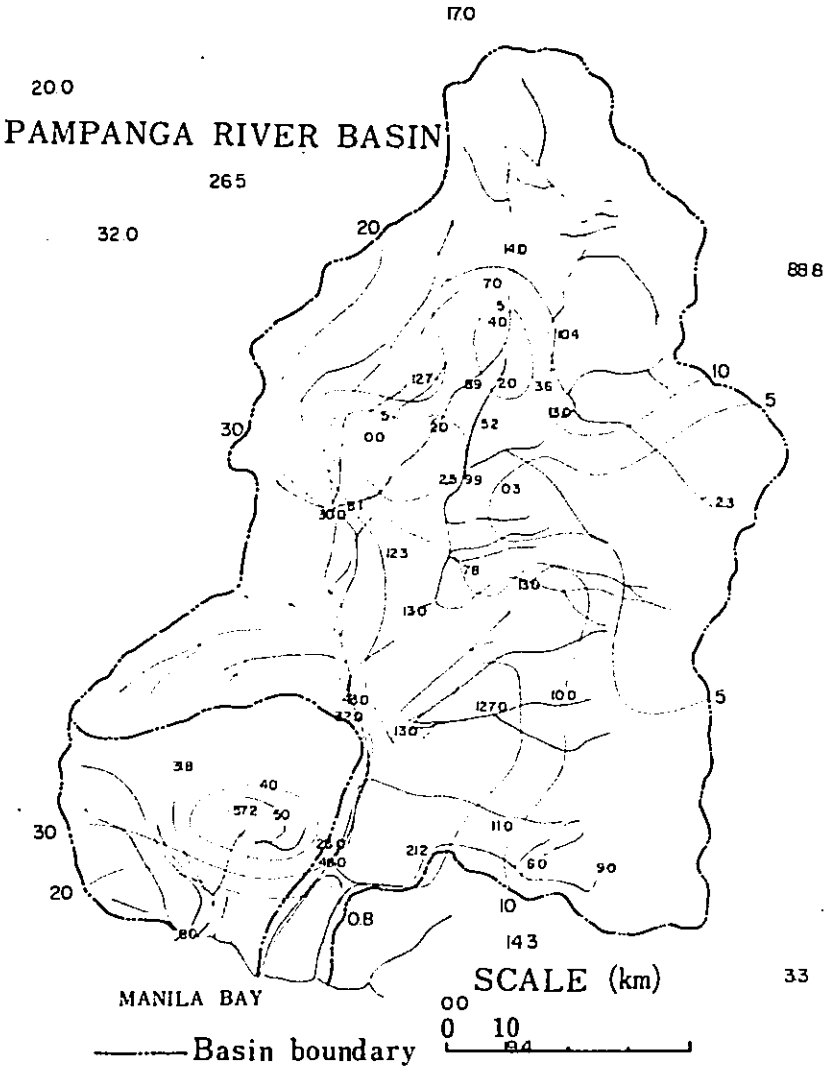


Fig. B.5.12 Isohyetal Map Oct. 16, 1973

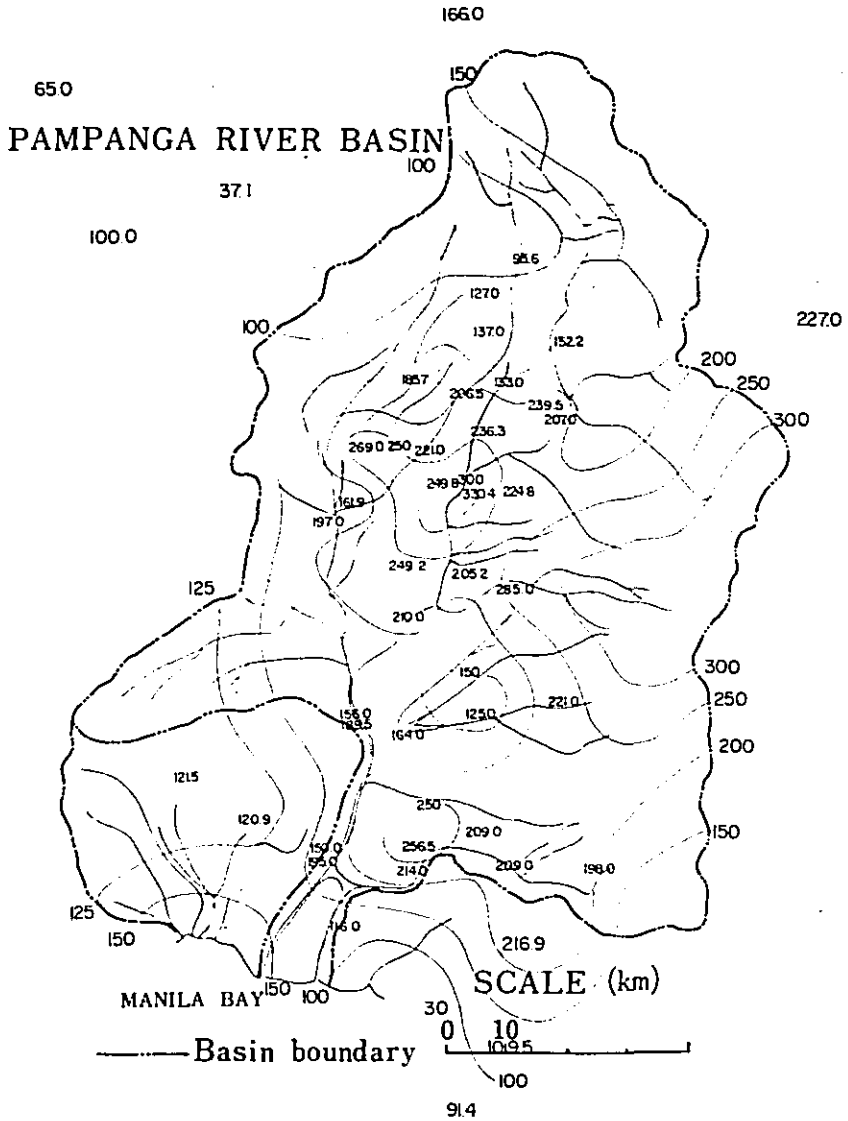


Fig. B.5.11 Isohyetal Map Oct. 15, 1973

Table B.5.15 Basin Daily Rainfall Oct. 1973

Monthly summary of basin daily rainfall (mm)

River System : Pampanga Oct. 1973

Day	Arithmetic Mean (10)	Whole Pampanga River System												
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	0.7	.	.	.	.	.	.	.	.	.	.	.	.
4	.	3.9	.	.	.	.	.	.	.	.	.	.	.	.
5	.	0.3	.	.	.	.	.	.	.	.	.	.	.	.
6	.	26.1	.	.	.	.	.	.	.	.	.	.	.	.
7	.	73.5	.	.	.	.	.	.	.	.	.	.	.	.
8	.	37.4	.	.	.	.	.	.	.	.	.	.	.	.
9	.	0.9	.	.	.	.	.	.	.	.	.	.	.	.
10	.	1.0	.	.	.	.	.	.	.	.	.	.	.	.
11	.	24.4	.	.	.	.	.	.	.	.	.	.	.	.
12	.	17.0	.	.	.	.	.	.	.	.	.	.	.	.
13	.	10.8	.	.	.	.	.	.	.	.	.	.	.	.
14	.	94.2	.	.	.	.	.	.	.	.	.	.	.	.
15	.	155.2	.	.	.	.	.	.	.	.	.	.	.	.
16	.	0.9	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.	.	.
29	.	.	.	.	.	.	.	.	.	.	.	.	.	.
30	.	.	.	.	.	.	.	.	.	.	.	.	.	.
31	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	.	444.3	.	.	.	.	.	.	.	.	.	.	.	.

Table B.5.17 River Gage Reading (2) Oct. 1973

10-day summary of river-gage reading
at different stations

River System : Pampanga — Oct. 1973

No.	9		12		13		14		15		16		17	
Gaging Station	Cabu R.	Cabu	Pampanga R.	San Anton	Chico R.	Ilong na Muntl	Sumacbao R.	Plan	Pénaranda R. (H.W.)	San Josef	Penaranda R. (BR. Bt.)	San Josef	Penaranda R.	Poblacion
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11						1.88	7	1.15	7	30.20	6	27.41	7	3.60
					17	1.70	17	1.08	17	30.20	17	27.33	12	3.60
													17	3.52
12	6	1.13	7	4.80			7	0.99	7	30.30	6	27.66	7	3.40
							17	0.92	17	30.30	17	27.55	12	3.50
													17	3.40
13							7	0.87	7	30.25	6	27.56	7	3.32
							17	0.84	17	30.25	17	27.30	12	3.30
													17	3.30
14							7	0.82	7	30.20	6	27.28	7	3.20
							17	0.80	17	30.20	17	27.25	12	3.60
													17	3.60
15	6	3.00	7	5.00		1.53	7	0.78	7	30.20	6	27.21	7	3.50
					17	1.46	17	0.77	17	30.40	17	27.26	12	3.62
													17	3.60
16							7	2.62	7	32.80	6	29.70	7	6.20
							17	2.08	17	30.85	17	28.77	12	7.20
													17	6.02
17			7	9.66		2.41	7	1.96	7	30.45	6	28.46	7	5.20
					17	2.17	17	1.83	17	30.40	17	28.41	12	5.02
													17	4.92
18	6	3.00					7	1.72	7	30.30	6	27.78	7	4.10
							17	1.60	17	30.30	17	27.68	12	4.01
													17	4.00
19			7	5.84		1.72	7	1.44	7	30.30	6	27.50	7	3.80
					17	1.66	17	1.36	17	30.30	17	27.45	12	3.65
													17	3.60
20	6	3.00					7	1.21	7	30.20	6	27.41	7	3.60
							17	1.14	17	30.20	17	27.40	12	3.58
													17	3.56

Table B.5.16 River Gage Reading (1) Oct. 1973

10-day summary of river-gage reading
at different stations

River System : Pampanga — Oct. 1973

No.	9		12		13		14		15		16		17	
Gaging Station	Cabu R.	Cabu	Pampanga R.	San Anton	Chico R.	Ilong na Muntl	Sumacbao R.	Plan	Pénaranda R. (H.W.)	San Josef	Penaranda R. (BR. Bt.)	San Josef	Panaranda R.	Poblacion
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	6	0.54	7	3.00	7	1.29	7	0.96	7	30.05	6	27.01	7	2.60
					17	1.33	17	0.94	17	30.05	17	27.00	12	2.60
													17	2.60
2							7	0.92	7	30.10	6	27.22	7	2.60
							17	0.90	17	30.10	17	27.15	12	2.60
													17	2.60
3	6	0.52	7	3.04	7	1.34	7	0.88	7	30.10	6	27.05	7	2.60
					17	1.34	17	0.86	17	30.10	17	27.00	12	2.72
													17	2.70
4							7	0.84	7	30.10	6	26.95	7	2.68
							17	0.91	17	30.05	17	26.92	12	2.68
													17	2.68
5	6	0.49	7	2.98	7	1.28	7	0.89	7	30.05	6	26.91	7	2.66
					17	1.29	17	0.87	17	30.05	17	26.88	12	2.66
													17	2.64
6							7	1.76	7	30.05	6	26.90	7	2.62
							17	1.65	17	30.05	17	26.82	12	2.62
													17	2.60
7							7	2.15	7	30.85	6	28.83	7	4.60
							17	2.01	17	30.60	17	28.46	12	5.50
													17	5.70
8	6	1.25	7	4.76	7	2.32	7	2.26	7	30.50	6	27.88	7	4.90
					17	2.86	17	2.11	17	30.50	17	28.63	12	4.70
													17	5.00
9							7	1.96	7	30.70	6	28.56	7	4.30
							17	1.73	17	30.50	17	28.03	12	4.10
													17	4.02
10			7	6.25	7	2.16	7	1.47	7	30.30	6	27.87	7	3.90
					17	1.95	17	1.30	17	30.30	17	27.72	12	3.80
													17	3.60

Table B.5.19 River Gage Reading (4) Oct. 1973

10-day summary of river-gage reading
at different stations

River System : Pampanga — Oct. 1973

No.	19		20		22		23		27		40		46	
Gaging Station	Baliwag R.		Catalanacan		Benituan R.		Pasong Intsik		Talavera R.		Cabobolonan		Rio Chico R.	
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1	6	1.55	6	2.00	7	1.18	7	4.02	7	5.56	6	11.60	7	10.92
			17	1.80	17	1.18	17	3.96	12	5.53	12	11.48	12	11.20
									17	5.45	17	11.46	17	10.92
2			6	1.67			7	3.80	7	5.43	6	11.56	7	11.30
			17	1.32			17	3.83	12	5.50	12	11.38	12	11.18
									17	5.54	17	11.34	17	10.88
3	6	1.50	6	1.20	7	1.17	7	3.77	7	5.56	6	11.50	7	10.80
			17	1.13	17	1.17	17	3.72	12	5.55	12	11.46	12	11.10
									17	5.54	17	11.30	17	11.20
4			6	1.12			7	3.67	7	5.62	6	11.50	7	11.60
			17	1.35			17	3.63	12	5.60	12	11.46	12	11.52
									17	5.57	17	11.30	17	11.40
5	6	1.50	6	1.23	7	1.12	7	3.61	7	5.54	6	11.42	7	11.62
			17	1.80	17	1.17	17	3.58	12	5.49	12	11.38	12	11.52
									17	5.83	17	11.30	17	11.40
6			6	1.93			7	3.54	7	5.33	6	11.88	7	11.42
			17	1.70			17	3.51	12	5.29	12	11.30	12	11.30
									17	5.25	17	11.36	17	11.10
7			6	1.57			7	3.54	7	5.19	6	11.88	7	11.84
			17	1.54			17	3.63	12	5.23	12	11.70	12	11.68
									17	6.71	17	11.36	17	11.40
8	6	1.45	6	1.55	7	1.82	7	4.04	7	7.56	6	12.20	7	12.00
			17	3.00	17	1.84	17	5.10	12	7.82	12	12.12	12	12.04
									17	8.38	17	12.08	17	12.04
9			6	4.68			7	6.72	7	10.58	6	13.00	7	13.88
			17	4.30			17	7.10	12	10.96	12	13.04	12	13.04
									17	11.20	17	13.06	17	11.04
10	6	1.20	6	4.18	7	1.90	7	7.57	7	11.82	6	-	7	12.20
			17	3.20	17	1.90	17	7.66	12	11.43	12	-	12	11.80
									17	11.49	17	-	17	11.66

Table B.5.18 River Gage Reading (3) Oct. 1973

10-day summary of river-gage reading
at different stations

River System : Pampanga — Oct. 1973

No.	9		12		13		14		15		16		17	
Gaging Station	Cabu R.		Pampanga R.		Chico R.		Sumacbao R.		Peñaranda R. (U.S.)		Peñaranda R. (RR. Br.)		Peñaranda R.	
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21							7	1.07	7	30.15	6	27.30	7	3.52
							17	1.03	17	30.15	17	27.25	12	3.50
													17	3.48
22	6	0.98	7	4.41	7	1.46	7	0.97	7	30.10	6	27.10	7	3.40
					17	1.44	17	0.94	17	30.10	17	27.13	12	3.20
													17	3.10
23							7	0.85	7	30.00	6	27.01	7	2.96
							17	0.81	17	30.00	17	27.00	12	2.92
													17	2.90
24			7	4.11	7	1.38	7	0.88	7	29.80	6	26.95	7	2.80
					17	1.38	17	0.86	17	29.80	17	26.91	12	2.72
													17	2.68
25	6	0.84					7	0.84	7	29.80	6	26.86	7	2.60
							17	0.82	17	29.80	17	26.90	12	2.60
													17	2.60
26			7	3.83	7	1.31	7	0.99	7	29.75	6	26.81	7	2.60
					17	1.21	17	0.96	17	29.75	17	26.86	12	2.60
													17	2.60
27	6	0.76					7	0.92	7	29.65	6	26.80	7	2.60
							17	0.88	17	29.65	17	26.89	12	2.60
													17	2.60
28							7	0.85	7	29.60	6	26.78	7	2.60
							17	0.82	17	29.60	17	26.76	12	2.60
													17	2.60
29	6	0.74	7	3.69	7	1.29	7	0.70	7	29.60	5	26.75	7	2.60
					17	1.24	17	0.73	17	29.60	17	26.74	12	2.60
													17	-
30							7	0.71	7	29.60	6	26.73	7	2.60
							17	0.69	17	29.60	17	26.73	12	2.[illegible]
													17	2.38
31			7	3.56	7	1.21	7	0.67	7	29.60	6	26.71	7	2.52
					17	1.20	17	0.65	17	29.60	17	26.72	12	2.50
													17	2.[illegible]

Table B.5.21 River Gage Reading (6) Oct. 1973

10-day summary of river-gage reading
at different stations

River System : Pampanga — Oct. 1973

No.	19		20		22		23		27		40		46	
Gaging Station	Baliwag R.	Catalanacan	Benituan R.	Pasong Intalk	Talavera R.	Caboboloonan	Rio Chico R.	Sto. Rosario	Pampanga R.	San Agustin	Pampanga R.	Sulipan	Angat R.	Longos
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
21		.	6	1.71		.	7	7.36	7	11.90	6	14.75	7	13.72
		.	17	1.93		.	17	7.02	12	11.77	12	14.65	12	13.50
		.				.		.	17	11.66	17	14.55	17	13.38
22	6	0.90	6	2.00	7	1.86	7	6.98	7	11.32	6	14.20	7	13.20
		.	17	2.10	15	1.85	17	6.87	12	11.21	12	14.10	12	13.26
		.				.		.	17	11.11	17	14.06	17	13.20
23		.	6	2.36		.	7	6.74	7	10.72	6	13.92	7	13.00
		.	17	2.05		.	17	6.60	12	10.60	12	13.88	12	12.90
		.				.		.	17	10.48	17	13.82	17	12.60
24	6	0.75	6	1.91	7	1.80	7	6.58	7	10.15	6	13.64	7	12.60
		.	17	1.95	17	1.80	17	6.46	12	10.03	12	13.60	12	12.40
		.				.		.	17	9.91	17	13.51	17	12.20
25		.	6	2.16		.	7	6.02	7	9.62	6	13.38	7	12.20
		.	17	2.05		.	17	5.74	12	9.48	12	13.25	12	11.90
		.				.		.	17	9.36	17	13.17	17	11.60
26	6	0.64	6	1.82	7	1.69	7	5.80	7	9.00	6	12.98	7	12.22
		.	17	1.10	17	1.69	17	5.12	12	8.87	12	12.92	12	11.70
		.				.		.	17	8.75	17	12.86	17	11.40
27		.	6	1.11		.	7	5.00	7	8.41	6	12.80	7	12.00
		.	17	1.20		.	17	4.71	12	8.26	12	12.72	12	11.68
		.				.		.	17	8.12	17	12.52	17	11.20
28		.	6	1.27		.	7	4.43	7	7.67	6	12.46	7	12.10
		.	17	1.45		.	17	4.35	12	7.51	12	12.35	12	11.55
		.				.		.	17	7.36	17	12.25	17	11.10
29	6	0.54	6	1.61	7	1.53	7	4.24	7	6.95	6	12.18	7	11.80
		.	17	1.58	17	1.53	17	4.13	12	6.83	12	12.07	12	10.94
		.				.		.	17	6.72	17	12.03	17	10.98
30		.	6	1.62		.	7	4.09	7	6.48	6	11.98	7	11.80
		.	17	1.60		.	17	3.86	12	6.42	12	11.94	12	11.30
		.				.		.	17	6.34	17	11.89	17	10.97
31	6	0.48	6	1.64		.	7	3.90	7	6.15	6	11.78	7	11.70
		.	17	1.70		.	17	3.86	12	6.09	12	11.76	12	11.25
		.				.		.	17	6.03	17	11.70	17	10.98

Table B.5.20 River Gage Reading (5) Oct. 1973

10-day summary of river-gage reading
at different stations

River System : Pampanga — Oct. 1973

No.	19		20		22		23		27		40		46	
Gaging Station	Baliwag R.	Catalanacan	Benituan R.	Pasong Intalk	Talavera R.	Caboboloonan	Rio Chico R.	Sto. Rosario	Pampanga R.	San Agustin	Pampanga R.	Sulipan	Angat R.	Longos
Day	Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)		Time / Gage Height (m)	
11		.	6	2.38		.	7	7.87	7	11.28	6	13.23	7	13.04
		.	17	2.05		.	17	7.93	12	11.13	12	13.19	12	12.20
		.				.		.	17	10.98	17	13.12	17	11.60
12	6	1.20	6	1.89	7	1.90	7	8.00	7	10.52	6	13.18	7	11.90
		.	17	2.25	17	1.90	17	8.00	12	10.43	12	13.17	12	11.80
		.				.		.	17	10.37	17	13.11	17	11.80
13		.	6	2.60		.	7	7.97	7	10.14	6	13.06	7	13.04
		.	17	2.90		.	17	7.92	12	10.06	12	13.06	12	12.40
		.				.		.	17	9.96	17	13.02	17	13.00
14		.	6	3.65		.	7	7.84	7	10.68	6	13.02	7	13.04
		.	17	3.00		.	17	7.80	12	10.24	12	13.04	12	12.90
		.				.		.	17	10.58	17	13.08	17	12.90
15	6	1.16	6	2.49	7	1.80	7	7.90	7	10.68	6	13.18	7	12.20
		.	17	2.80	17	1.80	17	8.12	12	10.54	12	13.16	12	12.25
		.				.		.	17	10.47	17	13.16	17	12.40
16		.	6	6.85		.	7	8.35	7	11.58	6	13.20	7	15.68
		.	17	7.20		.	17	8.70	12	11.97	12	13.18	12	16.76
		.				.		.	17	12.70	17	14.11	17	13.55
17	6	1.02	6	7.86	7	2.00	7	8.99	7	12.88	6	14.96	7	15.60
		.	17	5.20	17	2.00	17	9.35	12	13.07	12	14.58	12	13.50
		.				.		.	17	13.22	17	14.74	17	13.40
18		.	6	3.00		.	7	9.20	7	13.37	6	15.07	7	13.92
		.	17	2.65		.	17	9.09	12	13.31	12	15.14	12	13.85
		.				.		.	17	13.22	17	15.20	17	13.98
19	6	1.00	6	2.10	7	1.90	7	8.95	7	12.92	6	15.28	7	13.40
		.	17	1.86	17	1.90	17	8.82	12	12.81	12	15.19	12	13.28
		.				.		.	17	12.71	17	15.15	17	14.90
20		.	6	1.48		.	7	8.02	7	12.42	6	15.02	7	13.90
		.	17	1.70		.	17	7.65	12	12.33	12	14.88	12	13.90
		.				.		.	17	12.22	17	14.88	17	13.90
		.				.		.						
		.				.		.						
		.				.		.						

Table B.5.23 Hourly Gage Height Oct. 16, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 16 1973

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	3·27	3·27	8·09	7·93	7·46	2·38	2·35				
2	3·82	3·50	8·07	7·96	7·45	2·30	2·37				
3	4·52	3·91	8·09	8·00	7·46	4·07	2·40				
4	5·96	4·38	8·10	8·05	7·44	3·58	2·42				
5	6·89	4·86	8·09	8·11	7·45	3·09	2·45				
6	·	5·30	8·11	8·19	7·75	2·66	2·47				
7	·	5·80	8·17	8·24	7·85	2·46	2·50				
8	·	6·11	8·21	8·33	7·87	2·32	2·54				
9	·	6·55	8·26	8·43	7·88	2·20	2·58				
10	·	6·87	8·30	8·53	7·90	2·04	2·62				
11	·	6·53	8·35	8·62	7·94	1·91	2·67				
12	6·69	6·56	8·39	8·71	7·82	1·85	2·72				
13	6·31	6·56	8·41	8·79	7·86	1·77	2·76				
14	6·28	6·56	8·47	8·85	7·87	1·69	2·80				
15	6·04	6·52	8·51	8·92	7·86	1·63	2·84				
16	5·88	6·59	8·56	8·98	7·84	1·57	2·87				
17	5·88	6·57	8·61	9·05	7·84	1·53	2·90				
18	5·79	6·55	8·65	9·12	7·85	1·47	2·92				
19	5·62	6·52	8·69	9·19	7·84	1·40	2·94				
20	5·48	6·59	8·74	9·27	7·85	1·36	2·96				
21	5·38	6·53	8·78	9·34	7·85	1·33	2·98				
22	5·29	6·55	8·82	9·40	7·85	1·30	2·97				
23	5·19	6·55	8·86	9·46	7·85	1·27	3·01				
24	5·11	6·55	8·91	9·53	7·85	1·24	3·02				

Table B.5.22 Hourly Gage Height Oct. 15, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 15 1973

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	·	·	·	·	·	·	·	·	·	·	·
2	·	·	·	·	·	·	·	·	·	·	·
3	1·01	2·36	7·88	8·00	5·83	37	2·18	·	·	·	·
4	·	·	·	·	·	·	·	·	·	·	·
5	·	·	·	·	·	·	·	·	·	·	·
6	1·05	2·23	7·89	7·99	5·88	36	2·20	·	·	·	·
7	·	·	·	·	·	·	·	·	·	·	·
8	·	·	·	·	·	·	·	·	·	·	·
9	1·03	2·16	7·91	7·94	5·89	36	2·27	·	·	·	·
10	·	·	·	·	·	·	·	·	·	·	·
11	·	·	·	·	·	·	·	·	·	·	·
12	1·10	2·13	7·91	7·90	5·87	36	2·21	·	·	·	·
13	·	·	·	·	·	·	2·23	·	·	·	·
14	·	·	·	·	·	·	·	·	·	·	·
15	1·35	2·12	7·92	7·87	5·89	37	2·24	·	·	·	·
16	·	·	·	·	·	·	·	·	·	·	·
17	·	·	·	·	·	·	·	·	·	·	·
18	1·86	2·49	7·95	7·86	5·89	40	2·26	·	·	·	·
19	·	·	·	·	·	·	·	·	·	·	·
20	2·29	2·70	·	·	·	1·66	2·28	·	·	·	·
21	2·94	2·85	7·95	7·86	5·92	1·34	2·29	·	·	·	·
22	2·57	2·91	7·96	7·87	5·86	1·59	2·30	·	·	·	·
23	·	·	·	·	·	·	·	·	·	·	·
24	2·97	3·14	7·97	7·90	7·49	2·12	2·33	·	·	·	·

Table B.5.25 Hourly Gage Height Oct. 18, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 18 1973

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	3.96	5.50	9.35	10.64	7.85	0.71	4.05				
2	3.96	5.59	9.34	10.67	7.85	0.70	4.07				
3	3.96	5.57	9.34	10.67	7.85	0.69	4.07				
4	3.96	5.58	9.32	10.70	7.85	0.68	4.11				
5	3.96	4.96	9.32	10.72	7.85	0.67	4.13				
6	3.96	4.85	9.30	10.70	7.85	0.66	4.14				
7	3.96	4.71	9.29	10.73	7.85	0.65	4.16				
8	3.96	4.59	9.28	10.74	7.85	0.64	4.18				
9	3.96	4.57	9.27	10.75	7.86	0.63	4.19				
10	3.96	4.55	9.25	10.76	7.85	0.62	4.20				
11	3.96	4.55	9.24	10.77	7.86	0.61	4.22				
12	3.96	4.55	9.23	10.78	7.86	0.60	4.23				
13	3.96	4.53	9.21	10.78	7.90	0.57	4.24				
14	3.96	3.96	9.20	10.78	7.90	0.57	4.26				
15	3.96	3.85	9.19	10.77	7.90	0.57	4.27				
16	3.96	3.85	9.18	10.71	7.90	0.56	4.29				
17	3.96	3.85	9.16	10.69	7.92	0.55	4.30				
18	3.96	3.85	9.15	10.68	7.91	0.54	4.31				
19	3.96	3.85	9.14	10.66	7.90	0.53	4.32				
20	3.96	3.85	9.12	10.64	7.90	0.52	4.32				
21	3.96	3.85	9.11	10.62	7.37	0.51	4.33				
22	3.96	3.85	9.10	10.60	7.37	0.51	4.33				
23	3.96	3.85	9.08	10.58	7.37	0.50	4.34				
24	3.96	3.85	9.07	10.56	7.38	0.50	4.34				

Table B.5.24 Hourly Gage Height Oct. 17, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 17 1973

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	4.98	6.55	8.96	9.58	7.85	1.21	3.04				
2	4.83	6.53	9.01	9.64	7.85	1.19	3.06				
3	4.78	6.50	9.07	9.70	7.85	1.17	3.22				
4	4.73	6.52	9.12	9.76	7.85	1.15	3.34				
5	4.52	6.55	9.18	9.82	7.85	1.12	3.37				
6	4.62	6.52	9.23	9.89	7.85	1.10	3.40				
7	4.78	6.57	9.27	9.93	7.85	1.08	3.44				
8	4.07	6.55	9.31	9.98	7.85	1.06	3.47				
9	3.82	6.51	9.34	10.02	7.85	1.04	3.51				
10	3.63	6.52	9.36	10.07	7.85	0.91	3.56				
11	.	6.55	9.38	10.11	7.85	0.87	3.61				
12	.	6.51	9.39	10.15	7.85	0.84	3.65				
13	.	6.52	9.40	10.20	7.85	0.85	3.69				
14	.	6.57	9.40	10.24	7.85	0.89	3.74				
15	3.96	6.51	9.40	10.29	7.85	0.82	3.78				
16	3.96	5.98	9.40	10.33	7.85	0.81	3.81				
17	3.96	5.95	9.40	10.38	7.85	0.79	3.85				
18	3.96	5.86	9.40	10.42	7.85	0.78	3.89				
19	3.96	5.85	9.40	10.47	7.85	0.77	3.90				
20	3.96	5.78	9.39	10.50	7.85	0.76	3.93				
21	3.96	5.77	9.38	10.53	7.85	0.75	3.96				
22	3.96	5.66	9.38	10.56	7.85	0.74	3.99				
23	3.96	5.61	9.37	10.59	7.85	0.73	4.01				
24	3.96	5.55	9.36	10.62	7.85	0.72	4.03				

Table B.5.27 Hourly Gage Height Oct. 20, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 20 1973

No.	58	59	60	61	62	63	64
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Isidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit
1							
2							
3	3.94	3.69	8.71	10.05	7.06	0.82	4.14
4							
5							
6	3.94	3.69	8.67	10.00	7.02	0.81	4.11
7							
8							
9	3.94	3.69	8.64	9.96	6.98	0.81	4.07
10							
11							
12	3.94	3.69	8.60	9.89	6.93	0.35	4.03
13							
14							
15	3.94	3.69	8.56	9.86	6.89	0.33	3.99
16							
17							
18		3.69	8.52	9.77	6.84	0.33	3.94
19							
20							
21		3.69	8.49	9.70	6.80	0.32	3.90
22							
23							
24		3.69	8.44	9.64	6.75	0.31	3.85

Table B.5.26 Hourly Gage Height Oct. 19, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 19 1973

No.	58	59	60	61	62	63	64
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Isidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit
1							4.34
2							4.34
3	3.94	3.85	9.03	10.51	7.36	0.89	4.34
4							4.34
5							4.34
6	3.94	3.85	8.98	10.46	7.34	0.87	4.34
7							4.34
8							4.34
9	3.94	3.85	8.95	10.40	7.30	0.86	4.33
10							4.33
11							4.32
12	3.94	3.75	8.91	10.34	7.26	0.85	4.31
13							4.30
14							4.29
15	3.94	3.69	8.87	10.27	7.22	0.84	4.29
16							4.28
17							4.27
18	3.94	3.69	8.83	10.22	7.19	0.83	4.26
19							4.25
20							4.24
21	3.94	3.69	8.79	10.16	7.15	0.82	4.22
22							4.21
23							4.20
24	3.94	3.69	8.75	10.11	7.10	0.82	4.18

Table B.5.29 Hourly Gage Height Oct. 22, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 22 1973

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1											
2											
3		3.69	8.03	9.04	6.40	0.28	3.35				
4											
5											
6		3.69	7.98	8.97	6.35	0.28	3.30				
7											
8											
9		3.69	7.92	8.90	6.33	0.28	3.27				
10											
11											
12		3.69	7.87	8.83	6.31	0.27	3.24				
13											
14											
15		3.69	7.81	8.77	6.26	0.23	3.20				
16											
17											
18		3.69	7.76	8.70	6.23	0.20	3.16				
19											
20											
21		3.69	7.69	8.63	6.21	0.19	3.12				
22											
23											
24		3.69	7.63	8.56	6.18	0.19	3.09				

Table B.5.28 Hourly Gage Height Oct. 21, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 21 1973

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1											
2											
3		3.69	8.39	9.57	6.71	0.31	3.81				
4											
5											
6		3.69	8.35	9.50	6.65	0.30	3.77				
7											
8											
9		3.69	8.31	9.43	6.62	0.30	3.71				
10											
11											
12		3.69	8.27	9.37	6.58	0.30	3.65				
13											
14											
15		3.69	8.23	9.30	6.54	0.30	3.59				
16											
17											
18		3.69	8.18	9.23	6.51	0.29	3.53				
19											
20											
21		3.69	8.13	9.17	6.47	0.28	3.47				
22											
23											
24		3.69	8.08	9.10	6.43	0.29	3.41				

Table B.5.31 Hourly Gage Height Oct. 24, 1973

Daily summary of hourly gage height (m) at different stations

River System : Pampanga Oct. 24 1973.

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Isidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	3:69	6:93	7:96	5:99	0:16	2:74	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	3:69	6:84	7:90	5:96	0:16	2:70	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	3:69	6:74	7:83	5:94	0:16	2:69	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	3:69	6:67	7:77	5:90	0:16	2:62	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	3:69	6:54	7:71	5:86	0:15	2:58	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	.	3:69	6:35	7:59	5:82	0:15	2:49	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	3:69	6:27	7:53	5:87	0:15	2:44	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.5.30 Hourly Gage Height Oct. 23, 1973

Daily summary of hourly gage height (m) at different stations

River System : Pampanga Oct. 23 1973

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Isidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	3:69	7:57	8:69	6:16	0:18	3:05	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	3:69	7:49	8:58	6:13	0:18	3:02	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	3:69	7:42	8:34	6:09	0:18	2:88	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	3:69	7:27	8:20	6:06	0:17	2:99	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	3:69	7:16	8:11	6:01	0:16	2:84	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	3:69	7:03	8:02	5:95	0:16	2:78	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.5.33 Hourly Gage Height Oct. 26, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 26 1973

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1											
2		3.69	5.52	6.91	10.51	0.16	2.12				
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14		3.68	5.19	6.59	10.52	0.16	1.99				
15											
16											
17		3.68	5.10	6.51	10.52	0.15	1.95				
18											
19											
20		3.68	5.02	6.44	10.52	0.15	1.91				
21											
22											
23		3.68	4.95	6.37	10.52	0.15	1.88				
24											

Table B.5.32 Hourly Gage Height Oct. 25, 1973

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Oct. 25 1973

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1											
2		3.69	6.18	7.88	5.81	0.15	2.44				
3											
4											
5		3.69	6.10	7.81	5.75	0.15	2.37				
6											
7											
8		3.69	6.02	7.34	5.77	0.15	2.34				
9											
10											
11		3.69	5.94	7.27	5.72	0.15	2.31				
12											
13											
14		3.69	5.87	7.20	5.74	0.14	2.27				
15											
16											
17		3.69	5.79	7.13	5.70	0.14	2.23				
18											
19											
20		3.69	5.69	7.06	10.51	0.14	2.19				
21											
22											
23		3.68	5.61	6.98	10.51	0.14	2.15				
24											

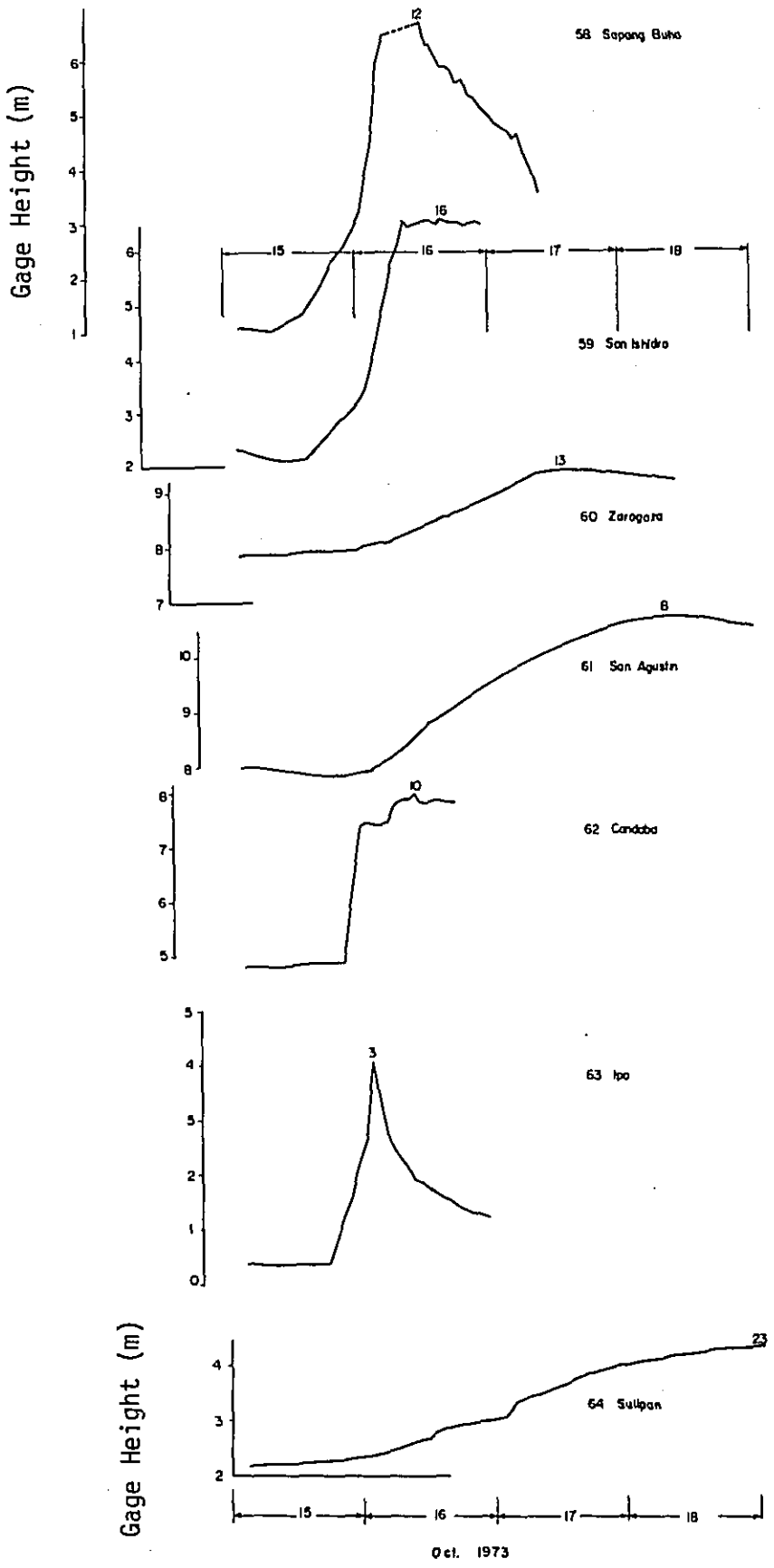


Fig. B.5.13 Hourly Gage Height Oct. 15-18, 1973

Table B.5.34 Mean Daily Gage Height at Sulipan, Apalit Oct. 1973

Monthly summary of mean daily gage height (m)

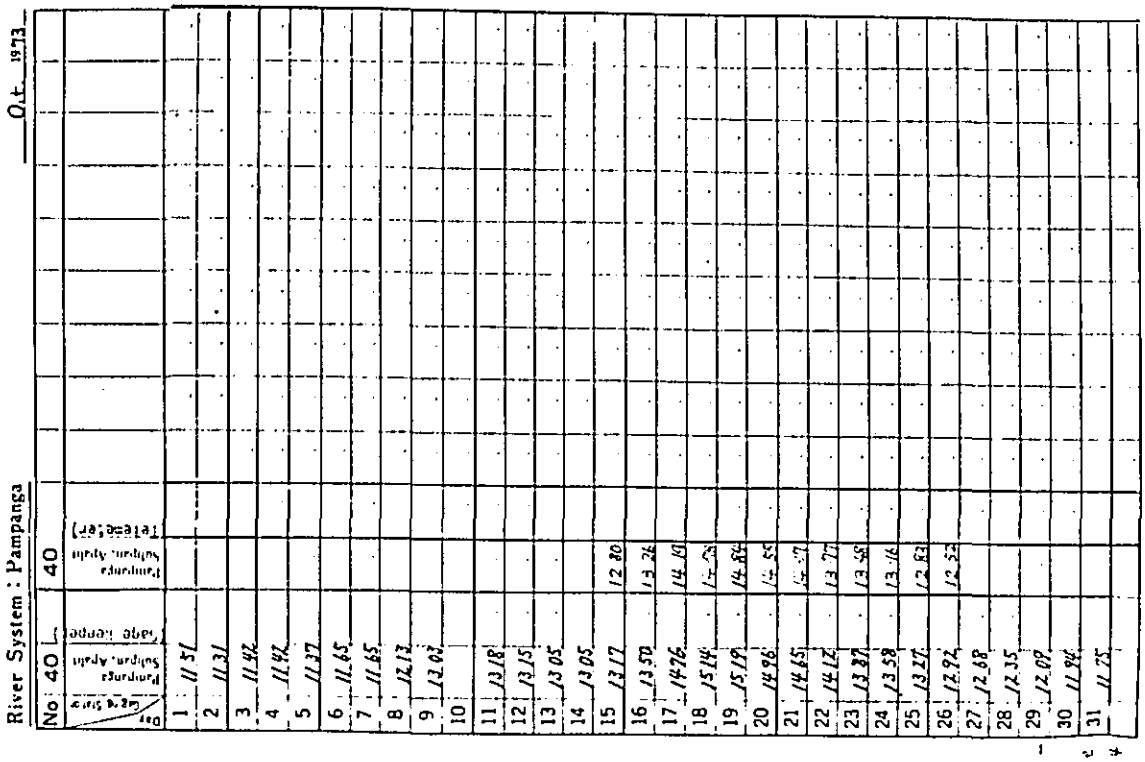


Table B.5.35 Date and Time of Peak Hourly Rainfall, and that of Peak Hourly Gage Height: Time Difference between Two Peaks Oct. 1973

Telemetering Station		Date and Time		
No.	Location	Peak Rainfall	Peak Gage Height	Time Difference between Two Peaks (hr)
1)	Sapang Buho	Oct.15, 24:00	Oct.16, 12:00	12
2)	Papaya	Oct.16, 3:00		
3)	San Isidro	Oct.16, 6:00	Oct.16, 16:00	10
4)	Zaragoza	Oct.16, 7:00	Oct.17, 13:00	30
5)	Arayat	Oct.16, 8:00	Oct.18, 8:00	48
6)	Sibul Spring	Oct.16, 3:00		
7)	Candaba	Oct.16, 8:00	Oct.16, 10:00	2
8)	Ipo	Oct.16, 3:00	Oct.16, 3:00	0
9)	San Rafael	Oct.16, 2:00		
10)	Apalit	Oct.16, 10:00	Oct.18, 23:00	61

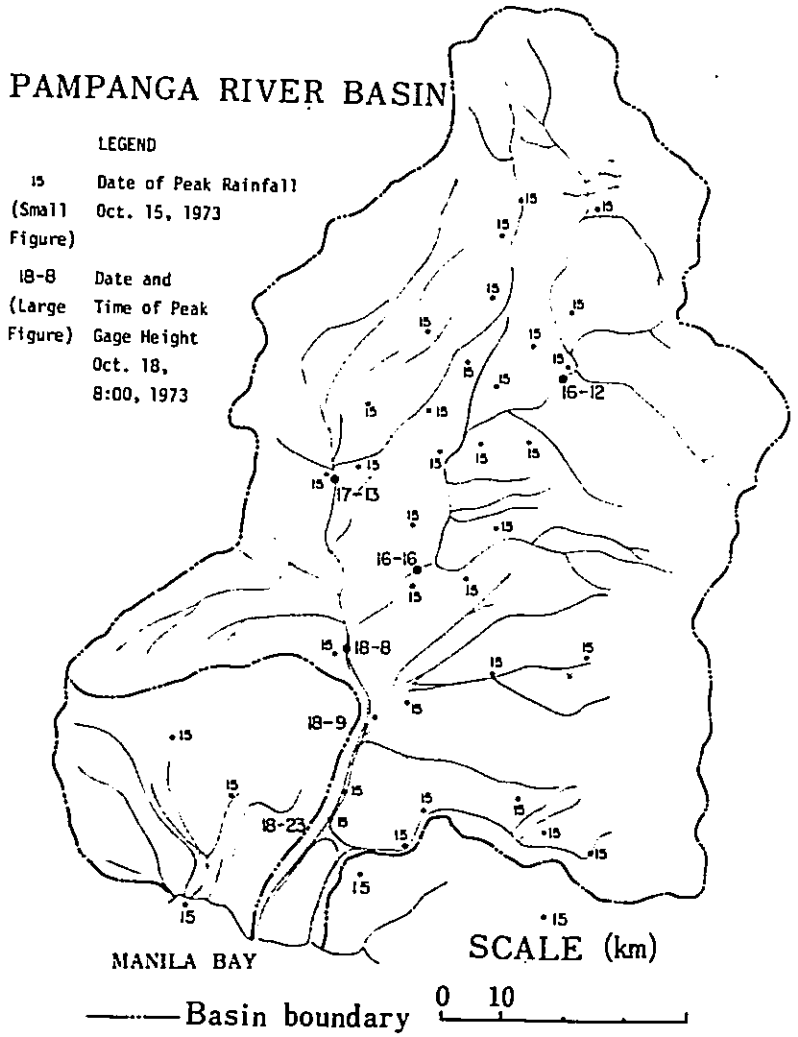


Fig. B.5.15 Date of Peak Rainfall, and Date and Time of Corresponding Peak Hourly Gage Height Oct. 1973

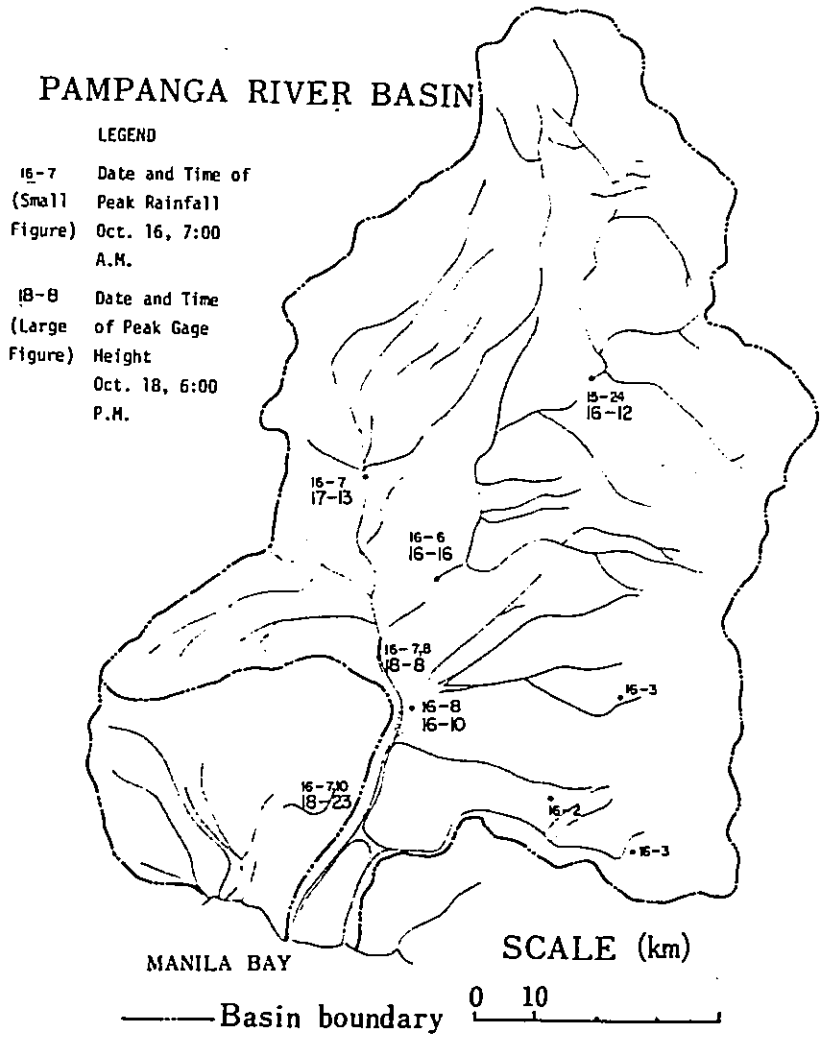


Fig..5.14 Date and Time of Peak Hourly Rainfall, and that of Corresponding Peak Hourly Gage Height Oct. 1973

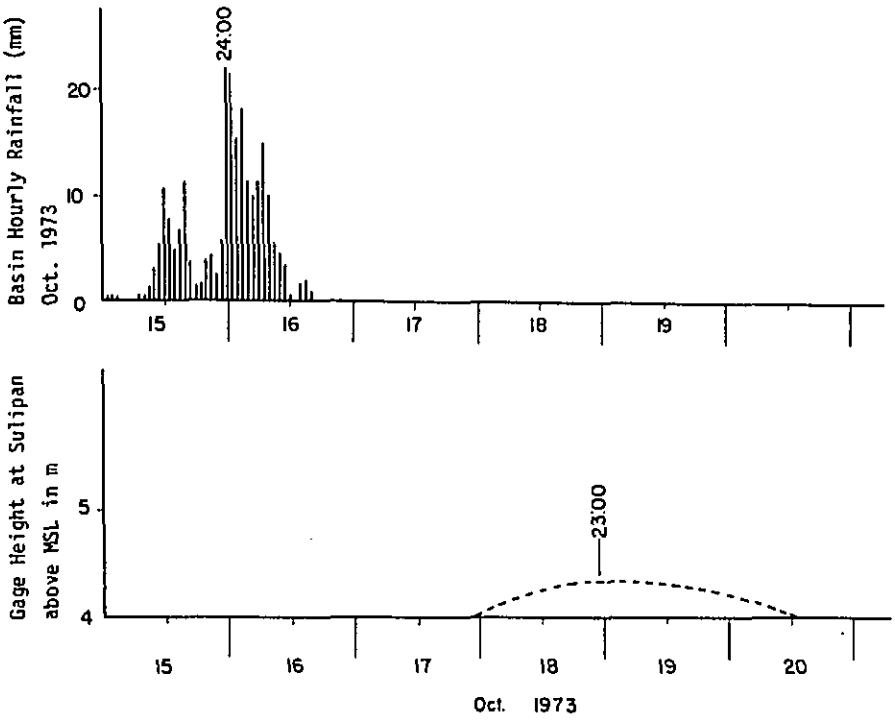


Fig. B.5.16 Hourly Gage Height at Sulipan, Apalit, with Basin Hourly Rainfall Oct.15-20, 1973

(7) Flood Damages

① Typhoon Luming (Nora) Oct. 2-9, 1973

(i) Damage Report on Infrastructure Facilities (from Bulletin Today -- Oct. 22, 1973)

(a)	Central Luzon	₱ 6 300 000
(b)	Ilocos Region	3 685 750
(c)	Cagayan Valley	1 200 000
(d)	Southern Tagalog Region	155 000
(e)	Bicol Region	3 200 000
	Total	₱ 14 538 750

(ii) Damage Report from Philippine National Red Cross

(a)	Total amount (estimated)	₱ 69 316 920
(b)	No. of houses destroyed	634 000
(c)	Families affected	22 670
(d)	Persons affected	129 363
(e)	Persons missing	20

② Typhoon Miling (Patsy) Oct. 9-12, 1973

Damages ..... No Report

③ Typhoon Narsing (Ruth) Oct. 12-17, 1973

Damages and Casualities by PHRC estimates:

(a)	Damages to Properties (Government & Private)	₱ 38 764 000
(b)	No. of houses destroyed	8 935
(c)	No. of families affected	47 829
(d)	No. of persons affected	244 599
(e)	No. of casualities (death)	27
(f)	No. of persons injured	30
(g)	No. of persons missing	23

(8) Flood Forecasting

(i) Introduction

The Flood Forecasting and Warning System for the Pampanga River Basin was established under the auspices of the ECAFE/WMO Typhoon Committee with financial and technical assistance from the Government of Japan. The System was inaugurated on 13 September 1973 but the final adjustment and testing of the equipment was carried on up to the second week of October 1973.

Hand in hand with the establishment of the telemetering system, the flood forecasting Expert from the Ministry of Construction of Japan, in collaboration with the Hydrologist of the Typhoon Committee Secretariat, provided the necessary guidance and supervision to local personnel on the techniques for operational flood forecasting.

(ii) Operational Flood Forecasting

With the approach of Typhoon Luming towards Northern Luzon on Oct. 8, it was decided to activate the telemetering system to transmit 3-hourly or hourly data on rainfall and water level to the Center.

The 24-hour basin rainfall is calculated; based on reports from the telemetering system. The basin rainfall is then used to obtain a 48-hour forecast of basin runoff or discharge at Sulipan by means of the Tank Model Method developed by Dr. M. Sugawara and recommended by the Japanese Survey Team. A programmable desk computer allowed the completion of necessary computations within 15-20 minutes. With the use of a derived stage discharge relationship and the forecast value of discharge, a water stage forecast at Sulipan is obtained. When the situation warrants this stage forecast is translated in items of areas likely to be inundated.

A Flood Outlook is issued when a rise in water level at Sulipan is expected but there is no imminent danger of inundation in the basin. The outlook gives the rate of rise and a one or two day water stage forecast at Sulipan.

A Flood Advisory is issued when the rate of rise increases and the forecast stage threatens to reach the assumed critical level of about 4 meters at Sulipan. The advisory includes a one or two day forecast of water stage at Sulipan and gives the areas likely to be inundated.

A total of 11 Flood Outlooks and 14 Flood Advisories were issued from October 8 to October 22. These were relayed promptly to (a) National Disaster Control Center, (b) Bureau of Public Works, Manila and (c) BPW River Control Office at Apalit. Information was also given to the Press and private individuals upon request.

(iii) Verification and Effectiveness of Flood Forecasts

A running plot of the computed against observed values of stage at Sulipan serves as a means of verifying and adjusting the forecast values. Figure 3 of this report shows the computed and observed stage hydrographs and also the hydrograph of the basin rainfall for the whole flood period.

Field survey of affected areas and station sites by the maintenance group and flood forecasting staff and advisers was also resorted to as a means of verifying the flood forecasts for the affected areas. Two surveys were made on land and one aerial survey was done by helicopter. Photographs of flooded areas were taken from the air.

Farmers between Malolos and Calumpit, Bulacan, who were interviewed in the afternoon of October 18 stated that radio broadcasts of flood advisories enabled them to harvest the palay before the flood waters rose to destructive levels. Inhabitants of towns in the Candaba area expressed keen interest in the flood advisories which they receive over the radio. The effectiveness of the flood forecasting system can also be partly attributed to the National Disaster Control Center for the prompt and efficient dissemination of flood advisories to the general public; particularly in affected areas.

According to the flood forecasting Expert from Japan, the initial effort of the Center can be considered as fairly successful.

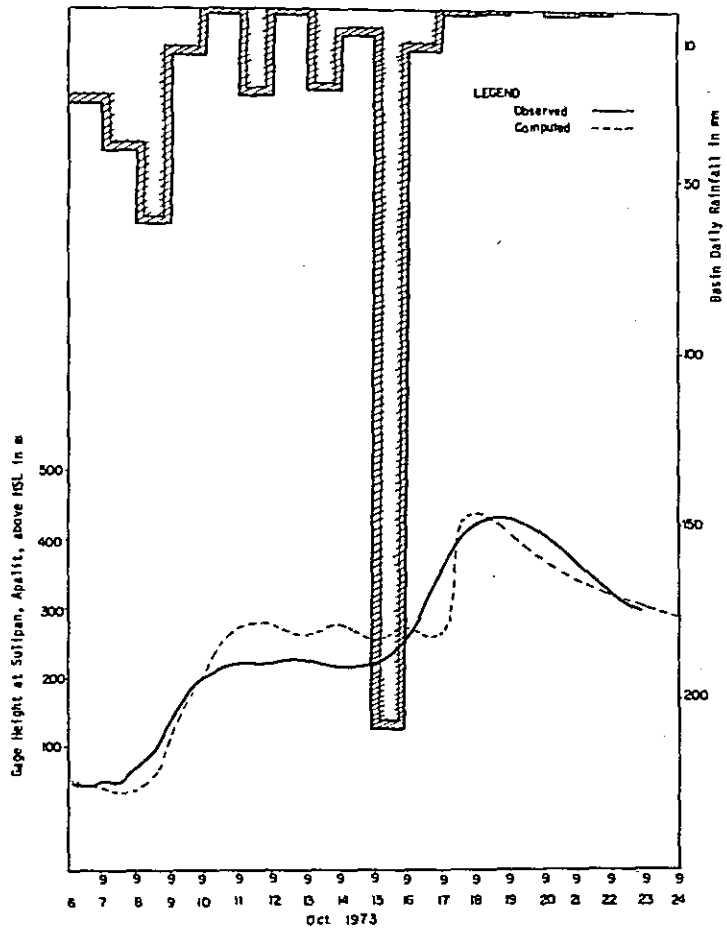


Fig. B.5.17 Computed and Observed Hydrographs at Sulipan, Apalit, with Basin Daily Rainfall Oct. 6-24, 1973

(iv) Sample Flood Outlook and Flood Advisory

Sample (1)

FLOOD FORECASTING CENTER
PAGASA, QUEZON CITY

15 OCTOBER 1973

FLOOD OUTLOOK NO. 13
ISSUED AT 15/2100H

THE WATER LEVEL AT SULIPAN STATION IS FORECAST TO BE 3.4 METERS ABOVE MEAN SEA LEVEL IN THE EVENING OF OCTOBER 16. MODERATE TO HEAVY RAINS ARE EXPECTED TONIGHT AND TOMORROW MORNING DUE TO TYPHOON PASSAGE NEAR THE PAMPANGA RIVER BASIN TOMORROW.

Sample (2)

FLOOD FORECASTING CENTER
PAGASA, QUEZON CITY

16 OCTOBER 1973

FLOOD ADVISORY NO. 1
ISSUED AT 16/0500H

AT 5 A.M. OCTOBER 16 THE WATER LEVEL AT SULIPAN IS RISING AT AN AVERAGE RATE OF 2.4 CENTIMETERS PER HOUR AND MODERATE TO HEAVY RAIN HAS BEEN FALLING OVER CENTRAL LUZON FOR THE PAST 17 HOURS.

THE WATER LEVEL AT SULIPAN IS EXPECTED TO REACH THE CRITICAL LEVEL OF ABOUT 4 METERS ABOVE MEAN SEA LEVEL BETWEEN 9 P.M. AND 12 MIDNIGHT OF OCTOBER 16. THERE IS RISK OF FLOODING OVER CANDABA, SAN SIMON, APLIT, CALUMPIT, PULILAN, HAGOMOY, PAOMBONG, MASANTOL, MACABEBE, SEXMOAN, GUAGUA, MINALIN, BACOLOR AND SAN FERNANDO.

(1)	Weather Record		
(2)	Typhoon Track	Fig. B.6.1-3	(P.209)
(3)	Rainfall		
	(i) Rainfall Station	Table A.4.5 Fig. A.4.2	(P. 14) (P. 16)
	(ii) Hourly Rainfall	Table B.6.1-16 Fig. B.6.4	(P.212) (P.220)
	(iii) Daily Rainfall (Isohyetal Map)	Table B.6.17-25 Fig. B.6.5-16	(P.221) (P.226)
	(iv) Basin Daily Rainfall	Table B.6.26	(P.232)
(4)	Gage Height		
	(i) Stream Gaging Station	Table A.4.6 Fig. A.4.3	(P. 17) (P. 19)
	(ii) River Gage Reading	Table B.6.27-32	(P.232)
	(iii) Hourly Gage Height	Table B.6.33-65 Fig. B.6.17	(P.235) (P.252)
	(iv) Mean Daily Gage Height	Table B.6.66 Fig.	(P.253) ( )
(5)	Discharge		
	(i) Stream Gaging Station	Table A.4.6 Fig. A.4.3	(P. 17) (P. 19)
	(ii) Mean Daily Discharge	Table Fig.	( ) ( )
(6)	Peak Time		
	(i) Peak Date and Time (Areal Distribution)		
	(a) Date and Time of Peak Gage Height	Table Fig.	( ) ( )
	(ii) Time Difference between Two Peaks		
	(a) Date and Time of Peak Hourly Rainfall, and that of Corresponding Peak Hourly Gage Height	Table B.6.67 Fig. B.6.18	(P.253) (P.254)
	(b) Date of Peak Daily Rainfall, and Date and Time of Corresponding Peak Hourly Gage Height	Fig. B.6.19	(P.254)
	(c) Date of Peak Daily Rainfall and Corresponding Peak Daily Gage Height	Fig.	( )
	(d) Hourly Gage Height Hydrograph with Hourly Rainfall at Sulipan, Apalit	Fig. B.6.20	(P.255)
(7)	Flood Record, Damages		( )
(8)	Flood Forecasting	Fig. B.6.21	(P.260)

(1) Weather Record

(i) Tropical Disturbance for June 1974

TYPHOON BISING (JUNE 8 - 11, 1974)

① Typhoon Bising started as a low pressure area at 12°N, 130°E in the evening of June 6 and intensified into a tropical depression with maximum winds of 55 kph at 13.4°N, 130.2°E near the center on the 8th. Rapid intensification occurred from then on until it reached its typhoon stage of 130 kph center winds and 974.0 mbs minimum sea-level pressure within a span of 12 hours. After its formation, Bising maintained a west to west-northwesterly movement with an average speed of 26 kph, slowing down as it came close to east coast of Luzon. It veered to a northwesterly path on June 9 maintaining its course until it crossed Luzon. It speed out to the South China Sea in a west southwest direction. The maximum 24 hour rainfall recorded over Virac, Catanduanes was 493.0 mm.

② TYPHOON DELING (JUNE 30 - JULY 5, 1974)

This tropical disturbance originated from a broad low pressure area northwest of Guam with center estimated at 15.2°N and 143.3°E along the ITCZ in the morning of the 28th of June. It moved towards northwest at 16 kph and intensified into a depression a few kilometers on the eastern boundary of the Philippine Area of Responsibility on the 30th with maximum center winds of 55 kph. It moved from southwesterly to westerly direction at 9 kph during its initial stay in the PAR. It rapidly intensified into a tropical storm in the early morning of July 1st and 24 hours later into a full-grown typhoon with maximum center winds of 120 kph. It started to change course slowly from a westerly to a north-northwesterly movement and came close to 650 kms northeast of Basco at 12 kph then accelerated to 18 kph until it left the PAR in the afternoon of July 4. Intensification of the Southwest monsoon brought slight rains over Lalawan and parts of Western Visayas giving a maximum record of 24 hour rainfall to 67.5 mm.

③ TROPICAL DEPRESSION EMANG (JULY 8 - 9, 1974)

Tropical depression EMANG did not affect any part of the country though it brought occasional rains and scattered thunderstorms due to the prevailing southwest monsoons.

④ TROPICAL STORM GADING (JULY 16 - 17, 1974)

Spotted as a low pressure area about 640 kms northwest of Guam, this disturbance developed quickly into a tropical storm on July 15 with maximum winds of 75 kph near the center.

It entered the PAR in a northwesterly direction coming close to the country at a distance of 1390 kms northeast of Casiguran, Quezon on the 16th and left the PAR, the next day leaving no damages to the archipelargo.

(ii) Tropical Disturbance for July 1974

① TROPICAL STORM MELING (JULY 17 - 18, 1974)

This cyclone was detected as a vortex on July 15 and developed into a tropical depression moving at an average speed of 24 kph in a northwesterly direction, on the 16th. It intensified into storm at about 8 AM with maximum winds of 85 kph near the center as it became embedded to the southwesterly airflow. It changed its northwesterly movement to a northerly course as it left the PAR on the 19th. The triggering of the southwest air mass gave some monsoon rains and occasional gusty winds over Luzon although no casualties or damages were reported.

② TYPHOON ILIANG (JULY 18 - 21, 1974)

This typhoon developed from an active low pressure area in the ITCZ northeast of Yap Island while Meling was heading slowly towards Taiwan and intensified into depression in the vicinity 11.8°N, 139.1°E with maximum winds of 55 kph and center pressure of 1002.3 mb in the afternoon of 17th. It entered the PAR 13.1°N, 135.0°E at an average speed of 25-30 kph moving in a west-northwest direction on the 18th and reached its typhoon strengh on the 19th with maximum winds of 220 kph and minimum pressure of 940 mbs of 20 kms diameter. It continued to move in a west-northwest direction, the eye passing just south of Baler at 8 AM of the 20th, then crossed the rugged terrain of Luzon south of Baguio and emerged into the south China Sea early in the evening of the same day. The maximum 24 hour rainfall recorded over Dagupan was 130.4 mm.

(iii) Tropical Disturbance for August 1974

There were three tropical disturbances that contributed to the heavy rains and floods over western and central Luzon including the Metropolitan Manila during the rainy month of August.

① TROPICAL DEPRESSION LOLENG (AUGUST 4 - 8, 1974)

Tropical depression Loleng developed from ITCZ entering the PAR as an active low pressure. It failed to develop beyond a tropical depression because of the vertical growth of the overhanging trough aloft and the southwest flow being dominated by the easterlies.

② TROPICAL STORM MIDING (AUGUST 9 - 10, 1974)

Miding originated from a vortex opposite Loleng moving to the west of Formosa. It changed its direction to the northerly course as a result of a secondary circulation moving northeasterly at a maximum winds of 75 kph and minimum pressure of 997.5 mbs in the 9th. The highest 24 hour rainfall recorded was 150.9 mm on the 10th of August at Port Area.

③ TROPICAL STORM NORMING (AUGUST 15 - 16, 1974)

Norming rapidly developed from a vortex formed by the ITCZ and weak easterlies. The very deep and strong river of westerlies prevailing south of the ITCZ propel Norming in an eastward direction with maximum winds of 110 kph and minimum pressure of 994.0 mbs of August 15. Each days of occurrence were embraced by the heavy monsoon rains prevalent at the time in metropolitan Manila, Western and Central Luzon giving a maximum rainfall of 228.4 mm over Cabanatuan City.

④ TROPICAL STORM OYANG (AUGUST 28 - 29, 1974)

Tropical storm Oyang developed from one of the vortices along the active ITCZ extending from Southern Ryukyus to Northern Vietnam. Its intensification was enhanced by the prevailing moderate to strong inflow of moist southwesterly winds over the area coupled with the existence of a divergent flow aloft.

Oyang initially moved east-northeast at an average speed of 26 kph under the influence of the prevailing westerlies and gradually decelerated to 17 kph as it shifted to a north-northeasterly course before it left the PAR in the evening of August 29. It attained its maximum intensity outside the PAR with maximum winds of 85 kph at Basco on August 28. The intensified southwest monsoons gave moderate to heavy rains over the Batanes giving a record of 168.4 mm of maximum 24 hour rainfall.

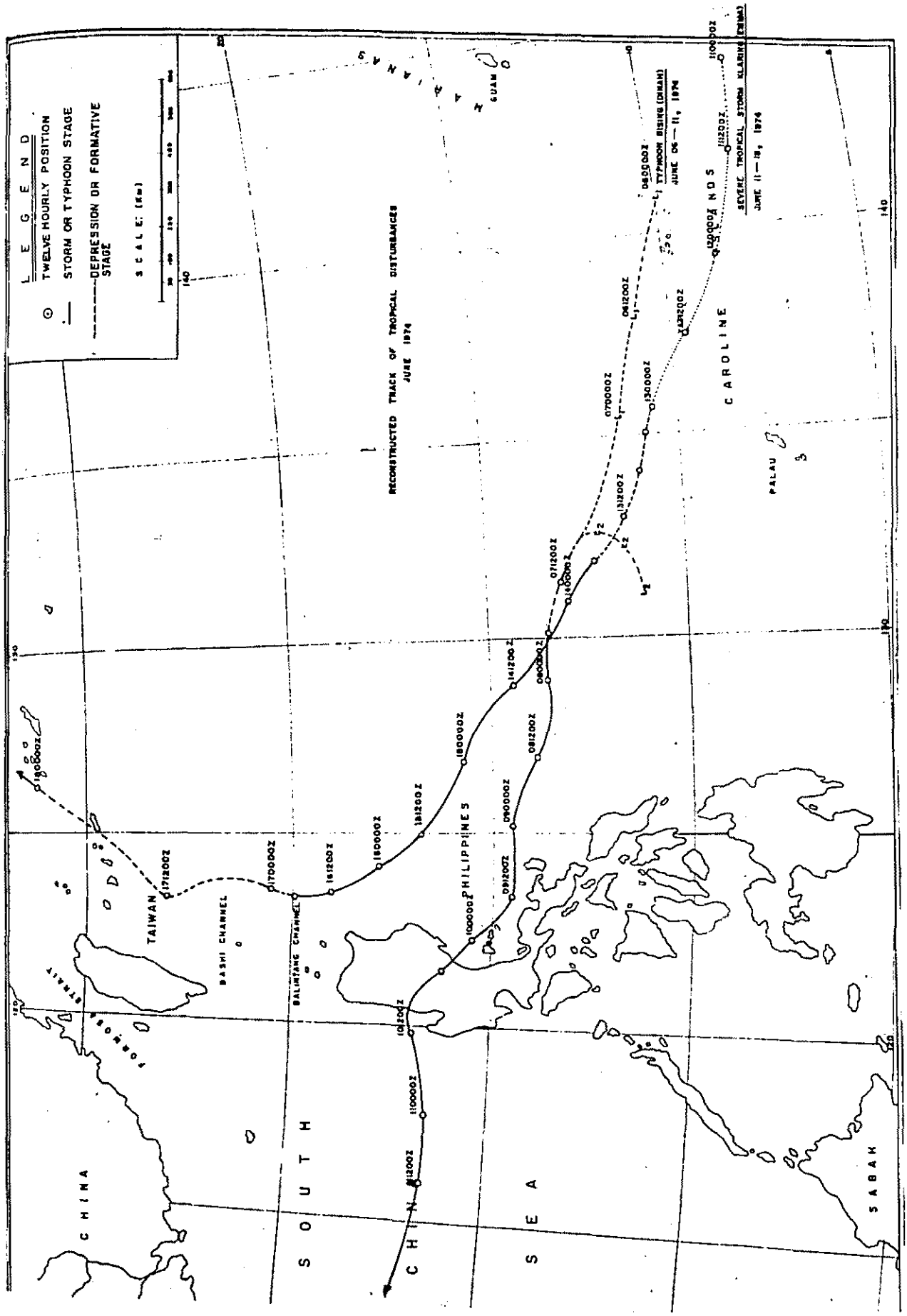


Fig. B.6.1 Typhoon Track in June 1974

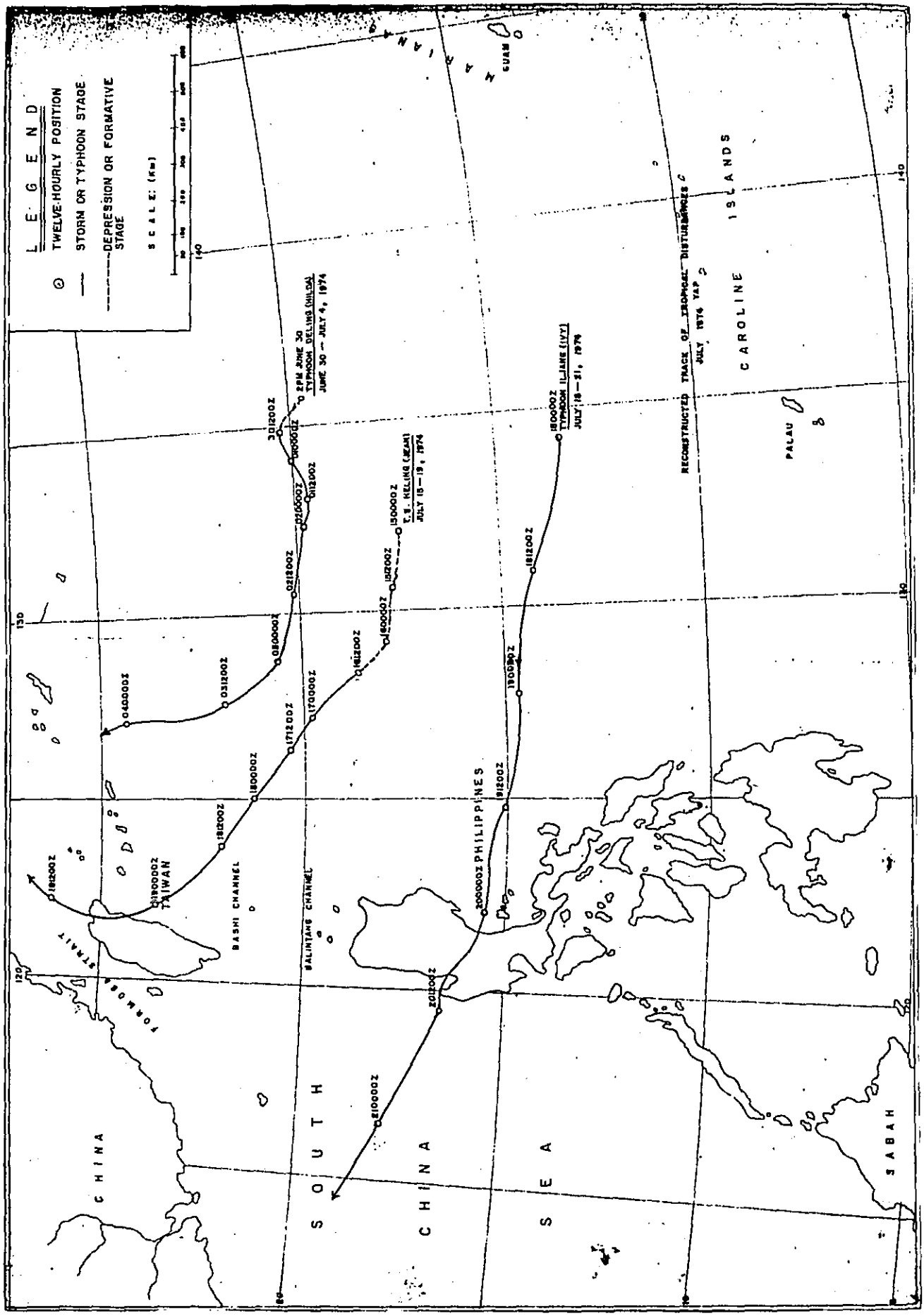


Fig. B.6.2 Typhoon Track in July 1974

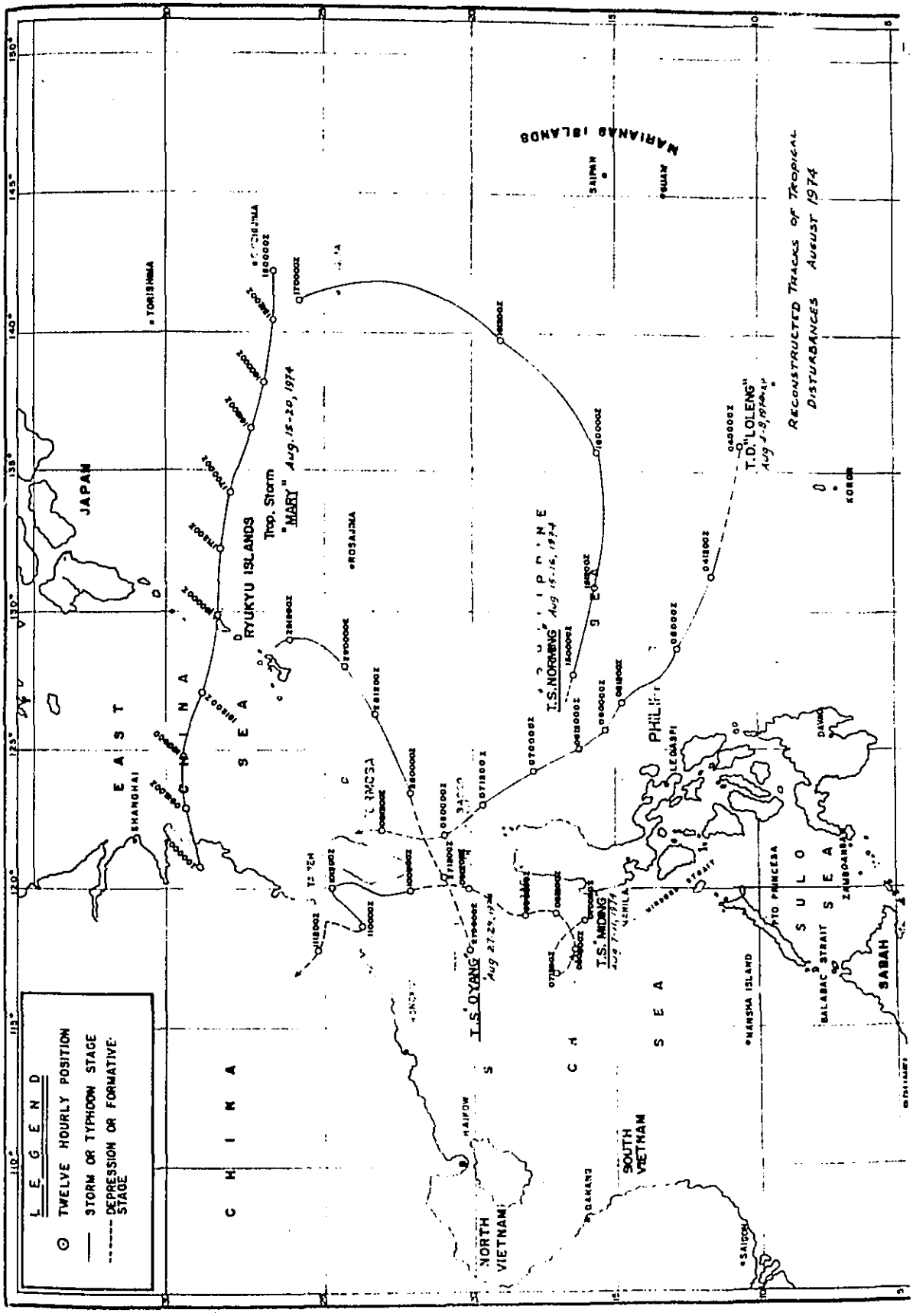


Fig. B.6.3 Typhoon Track in Aug. 1974

Table B.6.2 Hourly Rainfall June 10, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga June 10 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Ildefonso	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0 – 1	.	.	.	.	.	.	.	7.	1.	.	.
2	.	.	.	.	.	.	.	1.	1.	.	.
3	.	.	.	.	.	6.	.	1.	2.	.	.
4	.	3.	2.	.	.	8.	2.	7.	18.	.	.
5	8.	1.	9.	1.	5.	2.	3.	6.	7.	2.	.
6	.	.	.	5.	.	.	.	2.	.	.	.
7	.	.	.	.	.	.	.	4.	.	.	.
8	.	.	.	.	.	.	.	1.	.	.	.
9	.	.	.	.	.	.	.	1.	.	.	.
10	3.	.	.	.	.	.	.	1.	.	.	.
11	.	3.	2.	1.	.	4.	.	.	.	.	.
12	.	3.	3.	.	.	4.	.	3.	1.	.	.
13	3.	7.	1.	2.	.	1.	.	1.	.	1.	.
14	.	19.	3.	3.	1.	5.	1.	.	9.	5.	.
15	.	4.	1.	1.	1.	5.	.	4.	5.	2.	.
16	9.	3.	3.	1.	1.	2.	.	3.	4.	8.	.
17	.	20.	3.	.	2.	7.	1.	36.	10.	1.	.
18	.	5.	20.	13.	27.	16.	1.	7.	9.	14.	.
19	26.	10.	21.	6.	24.	8.	18.	21.	16.	14.	.
20	.	19.	23.	5.	8.	10.	34.	20.	8.	1.	.
21	.	20.	7.	1.	1.	15.	26.	10.	24.	5.	.
22	36.	36.	16.	3.	13.	39.	1.	4.	21.	.	.
23	.	11.	5.	2.	31.	4.	3.	7.	15.	6.	.
23–24	.	3.	1.	2.	2.	4.	2.	25.	7.	5.	.
Total	85.	167.	120.	46.	116.	14.	92.	192.	158.	69.	.
(9–9)	172.	178.	130.	99.	151.	139.	114.	151.	157.	112.	.

Table B.6.1 Hourly Rainfall June 9, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga June 9 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Ildefonso	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0 – 1	.	.	.	.	.	.	.	1.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	1.	1.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	1.	.	.
9	.	1.	.	.	1.	1.	.	1.	.	.	.
10	1.	1.	1.	.	.	.	.	2.	1.	.	.
11	.	1.	.	.	.	2.	.	2.	1.	1.	.
12	.	.	.	.	.	.	.	4.	.	.	.
13	1.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	1.	.	.	.
15	.	.	.	.	.	1.	.	1.	.	.	.
16	1.	.	.	.	.	1.	.	2.	1.	.	.
17	.	.	.	.	.	3.	.	.	1.	1.	.
18	.	1.	.	.	.	2.	.	1.	.	.	.
19	1.	1.	.	.	.	3.	1.	.	3.	1.	.
20	.	2.	1.	.	1.	.	1.	1.	1.	.	.
21	.	6.	.	.	.	15.	1.	13.	3.	1.	.
22	1.	2.	1.	.	.	20.	1.	9.	29.	2.	.
23	.	.	1.	.	1.	1.	.	1.	1.	1.	.
23–24	.	.	.	.	.	.	.	2.	.	.	.
Total	.	16.	5.	.	3.	89.	4.	41.	42.	7.	.
(9–9)	13.	19.	15.	6.	8.	65.	9.	69.	70.	9.	.

Table B.6.4 Hourly Rainfall June 12, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — June 12 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Ishidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0–1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	1.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	1.	2.	.	.	.	.	.	.	.
5	.	.	.	.	4.	.	.	.	.	2.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	2.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	1.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	1.	.	1.	.	6.	.	2.	.	.
16	5.	14.	5.	10.	3.	17.	1.	.	1.	.	.
17	.	5.	1.	.	1.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	1.	.
19	5.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	3.	.	.	.	2.	.	8.	.	.
23	17.	8.	11.	.	5.	3.	4.	.	.	3.	.
23–24	.	5.	.	1.	.	1.	.	.	.	.	.
Total	.	32.	22.	15.	14.	21.	13.	.	11.	7.	.
19–8	.	.	.	.	.	.	.	.	.	.	.

Table B.6.3 Hourly Rainfall June 11, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — June 11 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Ishidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0–1	38	1.	5.	32.	10.	2.	3.	.	4.	5.	.
2	.	2.	3.	4.	4.	2.	11.	1.	4.	32.	.
3	.	6.	8.	8.	6.	5.	8.	1.	12.	2.	.
4	33.	3.	.	.	.	3.	.	.	.	.	.
5	.	1.	.	5.	6.	.	.	.	.	3.	.
6	.	.	4.	6.	9.	.	1.	1.	1.	1.	.
7	24.	1.	.	2.	2.	1.	1.	2.	4.	2.	.
8	.	1.	1.	2.	3.	2.	3.	3.	3.	5.	.
9	.	.	1.	.	1.	1.	.	5.	2.	1.	.
10	14.	.	.	.	1.	.	.	7.	1.	2.	.
11	.	.	.	.	.	1.	.	11.	2.	.	.
12	.	.	.	.	.	.	1.	4.	.	.	.
13	4.	.	.	.	1.	.	.	.	1.	2.	.
14	.	.	.	1.	1.	1.	.	.	.	.	.
15	.	2.	.	.	.	1.	.	.	.	.	.
16	1.	.	.	.	.	.	.	.	.	.	.
17	.	.	2.	4.	6.	.	3.	.	.	3.	.
18	.	.	.	.	.	.	1.	.	1.	1.	.
19	.	.	.	.	.	.	.	.	4.	.	.
20	.	.	1.	.	.	1.	1.	.	.	1.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	1.	.
23	.	1.	.	.	1.	.	.	.	.	.	.
23–24	.	.	.	.	.	.	.	.	.	.	.
Total	.	18.	25.	64.	51.	20.	33.	35.	39.	61.	.
19–8	19.	3.	5.	7.	15.	5.	6.	27.	9.	13.	.

Table B.6.6 Hourly Rainfall July 19, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga July 19 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0–1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	1.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	2.	.	.	.
17	.	1.	.	.	1.2	.	.	4.	.	.	.
18	45.	29.	21.	1.	2.5	40.	14.	.	4.	.	.
19	.	.	1.	.	2.5	.	3.	2.	13.	.	.
20	.	.	.	.	.	1.	.	.	.	7.	.
21	.	.	.	.	.	.	.	.	.	0.5	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	0.6	.	1.	.	.	.	.
23–24	.	2.	.	.	.	1.	.	1.	.	.	.
Total	.	32.	22.	1.	6.8	42.	18.	28.	17.	7.5	.
(0–8	58.	56.	38.	8.	25.2	71.	46.	90.	40.	22.	.

Table B.6.5 Hourly Rainfall July 18, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga July 18 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0–1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	1.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	1.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	0.5	.
7	.	.	.	1.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	18.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	4.	.	.	.	.	.
20	8.	1.	.	.	.	1.	.	.	.	.	.
21	.	.	.	.	.	1.	.	1.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
23–24	.	.	.	.	.	.	.	.	.	.	.
Total	.	1.	18.	1.	.	6.	1.	1.	1.	0.5	.
(0–8	8.	1.	18.	1.	.	6.	1.	1.	1.	0.5	.

Table B.6.8 Hourly Rainfall July 21, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga July 21 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gagng Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Rangad
0~1	.	.	1.	.	8.5	.	.	.	.	5.1	.
2	.	.	.	10.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	2.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	0.5	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	2.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	.	1.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	1.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	1.	.	.
23~24	.	.	.	.	.	.	.	.	.	.	.
Total	.	1.	1.	12.	9.	2.	.	1.	1.	5.1	.
18~8	.	1.	1.	12.	9.	2.	.	1.	1.	5.1	.

Table B.6.7 Hourly Rainfall July 20, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga July 20 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gagng Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Rangad
0~1	8.	17.	11.	4.	6.5	19.	22.	20.	15.	0.5	.
2	.	3.	4.	2.	10.6	3.	5.	4.	4.	4.5	.
3	.	2.	.	.	0.6	2.	.	10.	2.	8.	.
4	3.	1.	1.	.	.	3.	1.	17.	.	1.	.
5	.	.	.	1.	.	.	.	1.	1.	.	.
6	.	.	.	.	.	.	.	2.	.	0.5	.
7	1.	.	.	.	0.7	.	.	5.	.	.	.
8	.	1.	.	.	.	2.	.	3.	1.	.	.
9	.	2.	1.	.	.	2.	1.	2.	.	0.5	.
10	12.	2.	1.	.	1.1	2.	1.	5.	2.	.	.
11	.	13.	4.	1.	0.5	9.	1.	10.	1.	1.	.
12	.	13.	6.	3.	4.8	9.	4.	8.	5.	0.5	.
13	64.	19.	7.	4.	4.8	6.	3.	17.	7.	2.	.
14	.	17.	5.	5.	4.8	9.	4.	21.	12.	3.6	.
15	.	7.	10.	13.	31.	10.	26.	11.	16.	6.7	.
16	28.	10.	20.	30.	18.1	6.	5.	8.	8.	13.3	.
17	.	9.	8.	11.	8.5	8.	7.	4.	7.	7.7	.
18	.	9.	9.	7.	6.4	5.	4.	2.	3.	5.6	.
19	17.	6.	5.	8.	4.8	3.	4.	1.	11.	5.6	.
20	.	4.	4.	4.	2.1	4.	2.	1.	4.	4.1	.
21	.	6.	1.	.	0.5	5.	.	.	2.	1.	.
22	3.	1.	.	1.	.	.	.	.	1.	0.5	.
23	.	.	.	.	.	2.	3.	1.	5.	.	.
23~24	.	.	1.	.	.	.	1.	.	.	1.	.
Total	.	142.	98.	94.	105.8	109.	94.	153.	107.	67.6	.
18~8	120.	118.	83.	109.	96.4	80.	66.	91.	94.	57.9	.

Table B.6.10 Hourly Rainfall Aug. 13, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Aug 13 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0 ~ 1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	1.	.	.
12	.	.	.	.	.	.	.	1.	5.	1.	.
13	.	.	.	.	1.	.	.	.	.	.	.
14	.	1.	12.	.	.	.	.	.	.	.	.
15	19.	.	.	.	.	.	.	.	.	.	.
16	1.	5.	.	.	.	1.	2.	.	.	.	.
17	2.	1.	.	6.	.	.	.	.	.	.	.
18	1.	.	.	5.	.	1.	4.	5.	9.	.	.
19	15.	.	.	.	.	.	.	5.	3.	.	.
20	9.	.	.	.	1.	.	2.	9.	3.	1.	.
21	1.	.	1.	.	.	.	.	12.	.	.	.
22	.	1.	.	.	.	.	.	5.	.	.	.
23	.	.	.	.	.	.	.	1.	.	.	.
23~24	.	.	.	.	.	.	.	1.	.	1.	.
Total	48.	8.	13.	11.	2.	2.	8.	39.	21.	4.	.
18~8	48.	8.	13.	11.	7.	3.	18.	49.	24.	12.	.

Table B.6.9 Hourly Rainfall July 22, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga July 22 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0 ~ 1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	3.	.	.	.
15	.	.	.	.	.	.	.	.	14.	.	.
16	.	.	.	.	.	.	.	.	8.	.	.
17	.	2.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	7.	.
19	5.	.	.	6.	.	.	.	.	.	.	.
20	.	.	.	2.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	1.	.	.	.	.
23~24	.	.	.	.	.	.	.	.	.	.	.
Total	5.	2.	.	8.	.	.	1.	3.	22.	7.	.
18~8	.	.	.	.	.	.	.	.	.	.	.

Table B.6.12 Hourly Rainfall Aug. 15, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Aug 15 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0 – 1	1·	1·	·	·	1·	2·	1·	4·	2·	·	·
2	·	·	1·	1·	1·	·	1·	1·	1·	3·	·
3	·	·	·	·	·	·	·	·	·	·	·
4	·	·	1·	1·	2·	·	1·	·	1·	4·	·
5	1·	3·	5·	5·	7·	4·	3·	3·	6·	12·	·
6	1·	1·	2·	2·	4·	2·	4·	12·	2·	9·	·
7	1·	3·	5·	2·	11·	7·	13·	27·	15·	2·	·
8	4·	7·	8·	9·	4·	9·	15·	1·	3·	2·	·
9	3·	6·	5·	5·	1·	3·	1·	11·	2·	5·	·
10	3·	1·	1·	5·	2·	2·	·	15·	4·	4·	·
11	·	1·	2·	1·	1·	5·	·	9·	3·	3·	·
12	3·	1·	2·	2·	10·	·	8·	·	2·	8·	·
13	1·	13·	2·	1·	·	6·	1·	2·	1·	1·	·
14	1·	·	·	2·	1·	·	·	3·	·	1·	·
15	·	·	3·	·	17·	·	4·	6·	1·	10·	·
16	3·	30·	18·	4·	17·	17·	16·	9·	11·	25·	·
17	3·	3·	3·	3·	5·	17	4·	6·	18·	4·	·
18	9·	8·	18·	10	13·	5·	4·	11·	5·	3·	·
19	10·	22·	19·	5·	26·	7·	12·	2·	8·	20	·
20	6·	11·	26·	8	5·	20	5·	17	13	5·	·
21	12	5·	5·	8	3·	6·	2·	7·	7	4·	·
22	5·	4·	6·	9	16·	3·	5·	3·	1·	1·	·
23	7	7	7·	7·	4·	5·	4·	1·	1·	·	·
23 – 24	10·	9·	2·	5·	1·	1·	1·	·	1·	·	·
Total	84·	186·	141·	95·	152·	121·	105·	150·	108	126·	·
0 – 8	108·	164	119	122·	171·	150	120	202·	134	127	·

Table B.6.11 Hourly Rainfall Aug. 14, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Aug 14 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0 – 1	·	·	·	·	·	·	·	·	1·	·	·
2	·	·	·	·	·	·	·	1·	·	·	·
3	·	·	·	·	·	1·	·	5·	1·	1·	·
4	·	·	·	·	·	·	·	·	·	·	·
5	·	·	·	·	·	·	·	·	·	·	·
6	·	·	·	·	·	·	·	·	·	·	·
7	·	·	·	·	·	·	·	2·	·	·	·
8	·	·	·	·	5·	·	10·	2·	1·	8·	·
9	·	·	1·	1·	2·	21	3·	27·	8·	3·	·
10	2·	1·	2·	·	·	4·	2·	11·	1·	·	·
11	·	1·	·	·	1·	1·	1·	2·	·	1·	·
12	·	·	·	·	·	·	1·	1·	1·	2·	·
13	·	·	·	·	·	1·	·	·	1·	·	·
14	·	·	·	·	·	·	·	2·	1·	4·	·
15	·	·	1·	4·	1·	4·	2·	4·	1·	·	·
16	3·	1·	1·	1·	1·	·	1·	2·	·	·	·
17	3·	1·	1·	·	·	1·	·	·	·	·	·
18	1·	·	·	·	·	·	·	·	·	·	·
19	·	·	·	·	1·	1·	5·	5·	4·	3·	·
20	·	1·	·	1·	2·	2·	1·	1·	2·	2·	·
21	·	·	·	1·	·	1·	·	·	·	1·	·
22	·	·	1·	·	1·	·	2·	1·	1·	5·	·
23	·	1·	1·	2·	2·	4·	3·	1·	4·	2·	·
23 – 24	·	·	1·	2·	5·	·	4·	2·	3·	11·	·
Total	9·	6·	9·	12·	21·	41·	35·	69·	30·	43·	·
0 – 9	17·	21·	31·	32·	46·	64	63·	107	57·	66·	·

Table B.6.14 Hourly Rainfall Aug. 17, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — Aug 17 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0–1	5.	5.	5.	8.	12.	17.	9.	24.	32.	15.	.
2	9.	9.	6.	10.	10.	19.	14.	11.	4.	2.	.
3	4.	6.	5.	16.	5.	28.	21.	6.	11.	4.	.
4	7.	5.	5.	7.	3.	21.	7.	10.	11.	4.	.
5	5.	5.	5.	7.	3.	10.	5.	8.	2.	2.	.
6	5.	5.	5.	8.	8.	13.	11.	8.	14.	4.	.
7	9.	7.	7.	9.	13.	17.	19.	9.	3.	10.	.
8	10.	8.	6.	13.	18.	10.	8.	7.	15.	3.	.
9	8.	8.	6.	8.	43.	18.	14.	3.	21.	6.	.
10	6.	8.	8.	5.	25.	9.	22.	25.	22.	13.	.
11	5.	5.	4.	3.	9.	21.	10.	10.	35.	19.	.
12	4.	7.	8.	8.	8.	9.	6.	6.	9.	9.	.
13	7.	9.	5.	5.	15.	10.	32.	7.	6.	3.	.
14	11.	6.	7.	8.	8.	57.	39.	3.	5.	8.	.
15	13.	11.	8.	8.	12.	24.	9.	7.	23.	19.	.
16	3.	5.	5.	2.	6.	10.	7.	44.	12.	10.	.
17	1.	3.	1.	1.	1.	5.	4.	16.	7.	7.	.
18	.	1.	3.	.	2.	2.	1.	6.	4.	4.	.
19	.	1.	1.	1.	1.	2.	1.	5.	3.	7.	.
20	.	1.	1.	1.	3.	3.	2.	7.	7.	6.	.
21	.	.	1.	1.	2.	1.	1.	7.	4.	2.	.
22	.	.	1.	.	1.	1.	2.	4.	1.	.	.
23	.	1.	1.	.	.	.	.	1.	.	.	.
23–24	1.	.	.	.	.	.	.	1.	1.	.	.
Total	113.	116.	104.	129.	208.	297.	244.	235.	252.	157.	.
(0–8)	59.	68.	44.	58.	141.	164.	152.	166.	164.	123.	.

Table B.6.13 Hourly Rainfall Aug. 16, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga — Aug 16 1974.

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0–1	5.	2.	2.	2.	1.	1.	1.	.	1.	.	.
2	4.	.	1.	3.	1.	.	3.	14.	2.	1.	.
3	.	.	1.	.	6.	1.	5.	9.	2.	3.	.
4	1.	.	1.	2.	3.	2.	2.	9.	3.	1.	.
5	1.	6.	2.	17.	18.	2.	7.	.	1.	.	.
6	9.	18.	6.	10.	13.	36.	26.	4.	12.	17.	.
7	7.	9.	9.	8.	4.	7.	6.	50.	32.	8.	.
8	5.	8.	4.	5.	3.	4.	3.	14.	3.	3.	.
9	3.	3.	1.	1.	4.	5.	5.	16.	17.	27.	.
10	1.	2.	6.	4.	14.	8.	28.	70.	29.	17.	.
11	4.	8.	7.	11.	5.	9.	8.	20.	5.	1.	.
12	9.	13.	14.	8.	2.	10.	7.	6.	2.	1.	.
13	4.	11.	6.	7.	3.	18.	15.	7.	12.	8.	.
14	14.	2.	5.	14.	10.	14.	3.	14.	19.	14.	.
15	10.	6.	7.	6.	4.	3.	1.	19.	3.	2.	.
16	7.	5.	5.	4.	8.	4.	5.	5.	5.	6.	.
17	2.	2.	5.	.	7.	9.	10.	9.	14.	7.	.
18	1.	1.	1.	2.	1.	1.	1.	7.	10.	5.	.
19	5.	1.	1.	8.	3.	1.	2.	7.	5.	2.	.
20	3.	1.	2.	7.	2.	1.	2.	3.	3.	6.	.
21	6.	6.	9.	25.	6.	7.	8.	8.	5.	3.	.
22	10.	8.	14.	7.	14.	9.	17.	12.	51.	17.	.
23	3.	11.	9.	9.	9.	19.	16.	48.	23.	9.	.
23–24	11.	9.	6.	12.	5.	16.	23.	36.	27.	18.	.
Total	125.	132.	128.	172.	146.	187.	204.	387.	286.	176.	.
(0–8)	147.	139.	142.	203.	169.	269.	245.	370.	322.	187.	.

Table B.6.16 Hourly Rainfall Aug. 19, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Aug 19 1974

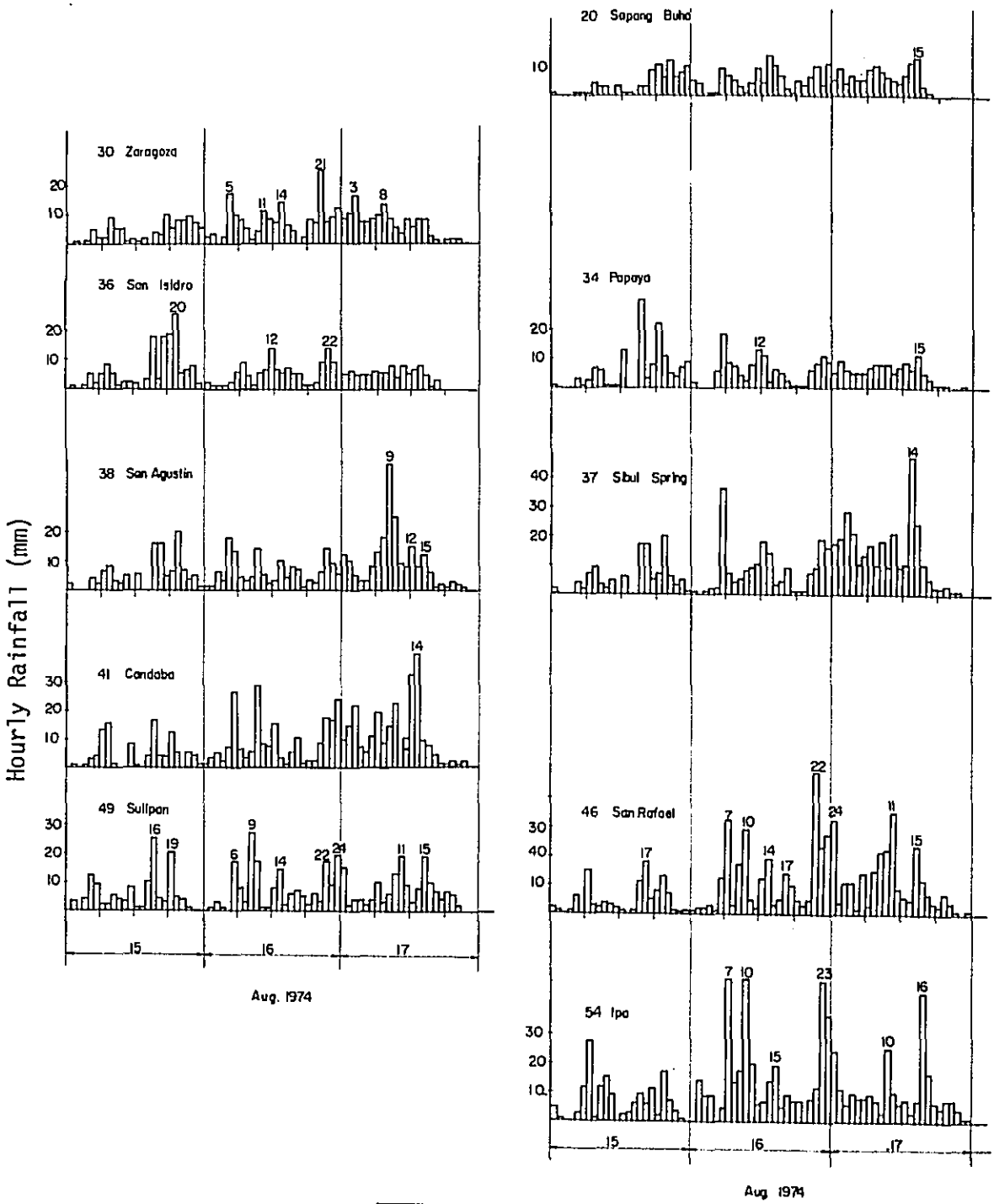
No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0-1	.	.	.	.	.	.	.	1.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	2.	.
12	.	.	.	.	1.	.	.	.	.	1.	.
13	.	1.	.	1.	.	.	.	2.	.	.	.
14	.	2.	1.	.	.	1.	.	.	.	.	.
15	.	1.	1.	.	1.	.	.	.	.	1.	.
16	.	7.	9.	.	1.	.	.	.	.	.	.
17	.	4.	.	.	1.	.	1.	1.	.	.	.
18	.	.	1.	.	1.	2.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	.	1.	.	.	.	1.	.	9.	.	.	.
21	.	.	.	1.	1.	.	3.	1.	.	5.	.
22	1.	.	1.	.	.	2.	.	2.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
23-24	.	.	.	.	.	.	.	3.	.	4.	.
Total	1.	16.	13.	2.	6.	6.	4.	19.	.	13.	.
(0-8)	1.	17.	14.	2.	23.	14.	7.	54.	.	17.	.

Table B.6.15 Hourly Rainfall Aug. 18, 1974

Daily summary of hourly rainfall (mm)
at different stations

River System : Pampanga Aug 18 1974

No.	20	34	36	30	38	37	41	54	46	49	27
Time \ Gaging Station	Sapang Buho	Papaya	San Isidro	Zaragoza	Arayat	Sibul Spring	Candaba	Ipo	San Rafael	Sulipan	Bangad
0-1	.	.	.	.	.	.	.	.	.	2.	.
2	.	.	.	.	.	.	.	2.	1.	.	.
3	.	1.	2.	1.	2.	.	.	.	.	1.	.
4	.	.	1.	1.	2.	.	1.	6.	1.	4.	.
5	.	1.	1.	1.	.	1.	1.	6.	1.	1.	.
6	.	.	.	.	1.	.	.	.	1.	.	.
7	.	.	.	.	.	1.	.	.	.	1.	.
8	.	.	.	.	.	.	.	.	.	1.	.
9	.	.	.	.	.	.	.	1.	.	.	.
10	.	.	1.	.	1.	.	.	2.	2.	4.	.
11	.	.	.	.	1.	1.	1.	3.	2.	2.	.
12	.	1.	.	.	.	.	1.	2.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	1.	.
15	.	.	.	1.	1.	.	.	.	.	2.	.
16	.	.	2.	.	7.	1.	.	.	.	.	.
17	.	2.	1.	.	3.	.	.	.	.	.	.
18	.	.	1.	.	1.	.	.	.	.	1.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
23-24	.	.	.	.	.	.	.	2.	.	.	.
Total	.	5.	9.	4.	19.	4.	4.	24.	8.	20.	.
(0-8)	.	3.	5.	1.	14.	2.	2.	11.	4.	10.	.



	20 Sapaing Buho
30 Zaragoza	
36 San Isidro	34 Papaya
38 Arayat	37 Sibul Spring
41 Candaba	
49 Apalit	46 San Rafael
	54 Ipo

Fig. B.6.4 Hourly Rainfall at Telemetering Stations Aug. 15-17, 1974

Table B.6.18 Daily Rainfall (2) June 1974

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — June 1974

No.	25	27	29	31	32	35	39	43	44	45	50	53	55
Day \ Gauging Station	Pamaldan Climo-Clinn	Rangad	Cabaldon	San Miguel Mo. Lulaite	Lambakin Jaen	Capan	San Agustin Arayat	Sta. Cruz Porac	San Fernando	Bacolor	Makinabang Railway	Harunyan	Masantol
1	13.9	19.8	5.3	3.8	8.1	5.1	10.0	7.1	22.4	2.5	5.6	16.5	-
2	6.1	10.9	5.8	2.3	2.8	4.1	20.1	9.7	7.4	15.2	4.8	11.9	-
3	4.8	9.7	5.6	23.1	16.8	36.8	42.7	55.4	28.4	22.9	5.1	46.7	30.7
4	7.9	3.1	13.7	34.3	11.9	19.8	27.7	37.4	55.7	111.8	3.3	21.6	34.1
5	0.5	0.5	2.8	9.4	2.0	.	8.1	8.7	35.8	76.2	5.1	.	14.7
6	.	.	.	28.2	.	.	-	-	.	.	2.5	.	.
7	2.3	.	11.9	17.1	7.6	.	.	-	.	.	.	.	.
8	0.5	12.7	3.1	0.5	0.8	0.5	3.3	0.8	7.6	1.8	6.1	44.7	.
9	10.9	14.3	33.8	5.1	22.1	2.0	7.7	10.4	14.2	17.5	76.0	100.6	5.6
10	183.9	157.0	144.5	72.6	137.1	107.9	185.8	174.0	135.9	159.3	39.9	87.9	72.4
11	9.0	1.8	9.9	17.3	6.4	9.9	15.8	46.0	23.4	27.2	53.1	30.3	20.1
12	9.9	35.1	20.3	10.4	20.3	.	10.4	15.5	7.1	8.4	41.7	.	-
13	6.4	21.1	2.5	.	2.5	.	23.4	-	.	.	6.9	.	.
14	.	.	.	.	0.5	.	.	.	.	.	3.0	.	.
15	.	.	.	.	.	.	1.5	.	.	.	9.1	.	.
16	1.0	-	5.8	4.1	5.6	.	.	.	.	.	.	.	.
17	.	.	.	.	0.5	.	.	-	.	.	.	.	.
18	11.4	17.0	3.3	10.7	.	.	.	.	.	.	.	.	.
19	.	.	.	3.3	6.9	.	.	1.5	5.3	.	.	.	-
20	.	.	.	3.6	1.5	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	6.6	.	.	.	.	.	.	.	.	.
23	26.8	29.2	.	.	11.9	.	.	.	.	.	.	4.6	.
24	2.8	47.8	.	39.1	12.2	-	.	4.1	17.0	4.1	0.5	.	-
25	.	.	-	6.6	.	1.0	.	-	.	1.3	11.4	.	10.7
26	.	.	0.8	.	.	.	.	.	3.0	35.0	26.7	.	-
27	.	.	.	.	.	.	.	1.8	.	.	1.8	.	.
28	.	.	.	.	.	.	.	.	.	.	10.2	.	.
29	.	.	.	0.5	.	.	48.8	9.6	21.8	17.8	2.3	.	.
30	15.5	.	.	1.3	5.1	8.6	5.6	10.4	29.0	27.9	-	.	26.4
31	.	.	.	.	.	.	.	.	.	.	.	.	.
Tot.	306.6	380.0	269.1	299.9	282.6	195.2	370.9	392.4	410.0	528.9	315.1	364.8	234.7

Table B.6.17 Daily Rainfall (1) June 1974

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — June 1974

No.	10	11	12	14	15	16	17	18	19	21	22	23	24
Day \ Gauging Station	Pantabangan Dam	TRIS Dam Tayabo	Cabanatuan San Jose City	Tondod San Jose City	PRIS Dam	Baloc Sto. Domingo	LTRIS Dam	Sibul	Pinahan Cen. Matinydad	Huracan Dam	PRRIS Dam Aitate	Bantug	Quezon
1	.	27.2	20.3	18.8	3.8	9.1	7.6	4.4	13.4	7.9	.	3.1	5.6
2	.	11.7	14.5	34.8	17.0	18.8	14.7	7.4	5.8	11.7	.	6.9	2.5
3	.	17.8	13.5	6.9	6.6	3.6	8.1	3.3	11.9	9.6	.	4.3	14.9
4	.	10.2	3.8	2.8	7.4	3.5	2.8	1.5	2.3	3.6	.	4.6	12.5
5	.	8.4	8.6	13.5	37.9	16.5	10.9	6.1	-	0.8	.	2.6	2.0
6	.	.	-	0.5	.	1.0	.	-	-	.	.	.	.
7	.	1.5	6.6	.	.	0.3	.	-	2.8	-	.	.	6.1
8	.	0.8	1.5	1.5	37.1	4.8	11.7	9.1	19.4	3.3	.	1.3	0.5
9	.	2.3	3.3	3.3	9.9	5.6	4.8	4.1	12.2	10.1	.	5.1	2.5
10	.	156.7	137.1	137.1	167.9	122.5	132.6	148.6	162.1	131.9	.	140.2	154.4
11	.	8.7	8.1	5.8	7.9	6.3	4.8	3.5	29.5	2.3	.	4.1	5.8
12	.	29.5	22.6	23.1	21.9	17.1	11.2	16.0	15.2	22.2	.	12.7	27.7
13	.	4.9	1.3	2.0	25.2	1.0	3.6	8.1	-	15.5	.	1.0	.
14	.	.	.	.	.	.	.	-	16.5	3.3	.	.	.
15	.	.	.	-	.	.	.	.	.	.	.	.	.
16	.	.	.	6.9	2.3	4.3	3.8	6.1	-	26.4	.	25.2	28.2
17	.	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	7.8	-	14.7	.	13.0	1.5
19	.	.	.	27.2	13.5	4.6	10.4	5.6	-	-	.	.	.
20	.	.	.	.	0.8	2.0	.	14.7	14.7	-	.	1.3	.
21	.	.	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	0.3	.	.	.	.	.
23	.	.	.	.	.	6.1	.	-	.	-	.	1.0	.
24	.	45.3	26.2	41.4	7.1	42.7	29.7	38.1	7.1	14.2	.	40.4	43.2
25	.	17.5	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.	.
27	.	-	.	-	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	1.5	.	.	.	.	.	28.9	.
29	.	.	15.2	3.6	.	12.7	2.5	-	.	.	.	3.3	7.1
30	.	3.3	12.5	49.1	.	35.8	1.0	2.3	.	0.8	.	5.1	6.4
31	.	.	.	.	.	.	.	.	.	.	.	.	.
Tot.	.	345.3	295.1	378.3	368.3	321.8	260.0	287.2	312.9	278.3	.	298.1	320.9

Table B.6.20 Daily Rainfall (1) July 1974

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — July 1974

No.	10	11	12	14	15	16	17	18	19	21	22	23	24
Day \ Gage Station	Pantabangan Dam	TRIS Dam Tayabo	Cabanatuan San Jose City	Tondod San Jose City	PRIS Dam	Baloc Sto. Domingo	LTRIS Dam	Sibul	Pinahan Cen. Natividad	Hurcon Dam	PRRIS Dam Alcate	Bantug	Quezon
1	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	3.3	3.1	.	T.	.	.
5	.	.	.	7.8	.	.	1.8	1.3	.	9.1	T.	.	7.4
6	.	0.8	3.1	1.3	33.8	27.7	2.0	26.4	.	6.4	32.3	31.5	19.3
7	.	6.6	28.1	45.2	19.6	6.6	16.5	16.0	4.1	12.4	5.1	17.0	43.7
8	.	31.7	15.5	31.2	22.1	35.8	20.6	12.7	5.3	4.6	T.	1.3	2.8
9	.	4.0	4.1	10.7	8.6	4.9	11.4	7.7	1.8	3.3	T.	5.8	4.5
10	.	8.9	3.6	10.4	2.5	3.8	10.7	18.8	23.1	36.4	15.2	34.5	30.0
11	.	5.1	0.6	5.8	9.6	6.4	9.7	2.5	T.	0.8	.	0.8	2.5
12	.	20.1	8.1	59.7	6.1	10.0	24.9	4.8	T.	0.5	19.8	1.0	11.0
13	.	7.6	10.2	15.5	45.0	.	17.3	2.5	.	2.3	2.3	0.8	5.6
14	.	0.8	17.0	3.0	6.9	.	2.8	.	.	2.3	21.6	28.3	T.
15	.	.	.	1.0	20.3	0.8	5.6	3.8	12.2	6.4	.	0.8	.
16	.	.	1.5	0.5	8.9	T.	.	0.8	27.7	6.9	2.5	T.	.
17	.	30.7	35.8	31.0	43.0	37.9	27.2	23.3	9.4	23.3	47.5	18.0	22.6
18	.	2.5	3.1	2.8	60.8	31.3	31.0	49.5	T.	19.6	4.8	41.2	10.9
19	.	25.4	8.4	13.3	21.8	0.9	15.2	11.7	.	26.0	38.6	10.4	8.4
20	.	97.3	106.4	113.5	151.5	92.4	90.7	108.3	152.1	100.1	62.2	86.4	80.0
21	.	.	.	.	.	.	.	.	.	.	.	.	.
22	.	5.6	.	18.3	.	2.0	.	11.4	T.	22.1	T.	3.6	.
23	.	0.8	8.1	4.6	.	T.	.	4.3	.	0.5	.	.	.
24	.	0.5	.	.	.	.	.	.	.	.	.	.	.
25	.	6.6	.	0.3	.	1.3	.	11.0	.	6.9	.	4.6	T.
26	.	18.5	15.5	24.9	1.0	3.6	1.5	18.5	14.2	0.8	7.1	0.3	33.3
27	.	29.9	37.6	2.8	.	3.3	1.3	11.4	.	2.5	.	.	1.5
28	.	.	.	T.	.	19.1	1.8	0.3	.	T.	.	2.8	.
29	.	.	29.0	T.	.	1.3	0.8	T.	T.	.	.	.	.
30	.	.	.	5.8	.	41.4	5.1	13.7	3.6	26.7	.	52.1	98.0
31	.	.	.	.	.	.	.	T.	.	.	.	.	.
Total	.	301.6	331.7	403.4	477.5	330.5	297.9	363.0	256.6	319.9	259.0	233.2	397.5

Table B.6.19 Daily Rainfall (3) June 1974

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — June 1974

No.	56	60
Day \ Gage Station	Meloles	Minuyan
1	13.7	1.8
2	1.0	1.8
3	31.5	95.6
4	52.5	78.9
5	18.6	45.2
6	1.8	0.3
7	.	.
8	10.2	16.0
9	41.4	112.3
10	51.1	145.0
11	26.6	31.0
12	3.0	11.5
13	.	1.3
14	1.8	3.6
15	.	7.4
16	.	.
17	.	.
18	.	.
19	.	.
20	.	.
21	.	.
22	.	.
23	0.5	6.1
24	0.3	26.7
25	8.8	0.5
26	0.5	42.7
27	1.3	8.6
28	.	2.0
29	0.3	.
30	0.8	.
31	.	.
Total	257.7	645.3

Table B.6.22 Daily Rainfall (3) July 1974

Monthly summary of daily rainfall (mm) at different stations

River System : Pampanga — July 1974

No.	56	60
Day \ Gauging Station	Malolos	Hinuyan
1	.	.
2	.	.
3	.	.
4	.	19.9
5	.	0.6
6	.	8.4
7	.	2.0
8	0.5	7.1
9	1.6	41.9
10	0.5	.
11	0.8	15.5
12	2.3	.
13	1.0	.
14	.	37.6
15	.	16.0
16	.	.
17	.	1.3
18	3.0	5.3
19	55.8	72.8
20	37.1	81.0
21	0.2	0.8
22	0.8	26.9
23	0.2	.
24	.	1.0
25	.	13.7
26	.	5.6
27	0.5	.
28	.	.
29	1.3	5.6
30	.	47.5
31	0.8	2.8
Total	111.4	419.3

Table B.6.21 Daily Rainfall (2) July 1974

Monthly summary of daily rainfall (mm) at different stations

River System : Pampanga — July 1974

No.	25	27	29	31	32	35	39	43	44	45	50	53	55
Day \ Gauging Station	Pamaldan Cinco-Cinco	Bangad	Gabaldon	San Miguel Ma. Luisita	Lambakin Jaen	Capas	San Agustin Arayat	Sta. Cruz Porac	San Fernando	Bacolor	Hacienda Baliwag	Marumpka	Hasentol
1	.	.	1.3	.	37.1	.	.	.	.	.	.	.	.
2	.	.	.	.	.	7.1	41.9	43.7	2.0	2.0	.	.	.
3	.	.	.	.	.	.	6.1	.	.	.	.	.	.
4	.	.	1.8	5.1	0.8	7.1	12.5	6.1	.	.	T.	.	.
5	1.3	3.1	13.0	.	2.8	17.5	10.7	T.	.	.	.	.	T.
6	1.8	29.2	1.8	0.8	21.9	15.2	1.0	1.5	7.1	10.2	7.6	.	3.3
7	14.7	1.3	5.6	8.4	14.2	55.1	28.2	10.2	38.1	32.3	26.7	.	35.8
8	1.0	4.8	11.4	.	3.8	28.5	5.9	16.5	3.6	25.4	0.8	.	T.
9	1.5	T.	6.4	11.9	3.8	.	.	5.6	4.8	15.5	5.3	.	T.
10	8.4	10.2	2.5	0.5	.	7.4	0.5	3.6	.	1.3	1.2	.	.
11	1.5	T.	.	7.8	.	2.0	3.1	.	.	2.5	.	.	.
12	.	.	.	20.8	.	2.8	15.0	.	7.4	2.5	.	11.4	.
13	6.9	T.	19.8	0.3	15.2	7.9	.	.	.	.	.	.	.
14	0.5	4.8	24.4	.	19.1	0.5	31.0	1.0	3.6	.	4.8	.	.
15	5.8	20.8	1.0	.	3.1	.	9.1	11.2	.	27.9	.	.	T.
16	.	2.5	0.5	.	.	.	.	.	.	.	.	.	.
17	34.3	28.7	5.3	5.3	10.9	3.6	1.5	1.0	.	.	0.5	.	.
18	10.7	35.3	21.1	.	5.6	32.5	.	.	.	.	.	.	.
19	17.3	60.4	53.3	6.9	26.7	23.9	24.9	11.5	18.4	16.5	53.3	45.2	18.0
20	100.1	91.2	187.7	8.4	79.5	95.8	96.3	140.5	89.4	80.0	73.4	67.1	82.0
21	.	.	.	1.0	.	0.8	.	.	.	.	.	.	.
22	15.8	10.4	.	.	.	.	.	.	.	.	7.4	11.7	.
23	.	1.0	.	0.3	.	.	.	.	.	.	3.8	.	.
24	.	.	.	.	.	.	.	.	.	.	13.0	.	.
25	7.1	7.6	.	.	T.	1.8	.	.	.	.	7.6	.	.
26	.	10.4	.	97.3	.	6.4	6.4	0.5	65.5	33.8	.	.	T.
27	.	18.0	.	3.3	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	1.8	15.0	.	.	.	14.0	11.4
29	.	.	.	.	.	.	.	.	.	.	.	9.4	T.
30	48.5	.	.	18.0	48.3	.	25.2	.	.	.	13.7	16.3	.
31	.	.	.	.	.	.	1.0	.	.	.	24.2	6.4	.
Total	281.2	319.7	356.9	196.1	244.5	315.9	322.1	267.9	239.9	249.9	243.3	181.5	150.5

Table B.6.24 Daily Rainfall (2) Aug. 1974

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — Aug. 1974

No.	25	27	29	31	32	35	39	43	44	45	50	53	55
Day \ Gaug Station	Tanaldan Cinco-Cinco	Bangad	Cabaldon	San Miguel Hda. Lulaita	Labakin Jaen	Gapan	San Agustin Arayat	Sta. Cruz Porac	San Fernando	Bacolor	Hacienda Baliuag	Marungko	Hasentol
1	3.6	5.1	6.1	1.0	3.0	.	2.8	.	.	.	4.8	8.9	5.3
2	1.5	1.0	6.4	0.3	0.5	4.6	1.3	.	.	.	.	.	.
3	.	.	.	.	.	.	2.5	.	.	.	4.1	.	.
4	9.4	7.6	40.1	39.1	5.6	8.6	9.9	.	19.0	11.9	.	11.2	.
5	.	.	0.5	.	.	.	.	5.8	.	.	.	7.9	.
6	30.7	3.3	5.8	17.8	14.5	3.1	1.3	8.6	.	2.0	3.0	6.1	.
7	3.3	.	0.8	22.6	31.8	1.0	22.1	10.6	3.0	11.4	.	.	.
8	7.7	3.8	8.6	7.9	5.6	5.1	11.4	6.9	17.8	18.2	16.7	15.0	19.9
9	5.6	15.5	5.1	6.6	13.0	4.6	7.1	4.8	3.8	5.0	2.5	2.8	16.3
10	11.2	15.5	15.8	18.8	13.7	2.5	15.0	32.0	33.8	52.8	71.1	26.4	81.0
11	10.9	8.4	1.8	5.8	11.7	2.0	4.5	1.5	3.8	4.0	9.9	11.9	20.6
12	14.2	7.4	3.3	3.3	10.9	.	.	6.1	.	1.0	6.1	11.2	16.8
13	43.7	29.0	5.8	20.6	8.9	2.0	6.5	9.6	11.9	14.8	7.8	47.5	13.5
14	29.7	21.3	5.1	40.9	26.2	23.4	49.1	66.8	98.7	86.6	81.3	99.1	62.5
15	120.9	122.7	117.9	182.5	111.7	152.4	170.7	137.8	160.5	149.1	168.6	98.7	127.5
16	172.8	152.2	91.2	240.8	160.3	180.2	163.6	154.7	282.2	305.5	353.1	101.1	188.4
17	51.6	53.6	58.2	52.8	57.2	71.2	151.2	107.2	107.8	187.9	146.6	55.6	129.9
18	.	.	0.8	2.8	1.5	3.0	15.5	31.2	4.3	17.3	7.4	.	10.9
19	1.5	.	1.8	2.6	4.1	19.3	22.6	7.4	18.0	22.1	43.4	.	23.4
20	19.6	34.0	11.2	16.8	10.9	5.6	14.3	17.5	11.1	15.7	39.6	10.4	48.5
21	3.0	1.0	16.0	10.4	3.8	8.1	11.7	13.8	13.2	19.8	13.8	16.3	11.2
22	3.3	.	.	.	.	6.6	.	1.0	.	2.8	.	22.9	.
23	5.3	2.0	3.6	9.7	1.5	6.6	14.5	9.7	9.6	5.1	1.5	.	13.7
24	19.5	.	20.1	18.0	6.6	0.5	.	8.6	7.4	21.6	1.8	7.4	5.8
25	.	25.7	36.8	1.8	29.2	16.3	.	.	.	4.8	9.9	.	.
26	.	0.5	2.3	.	0.5	27.9	1.5	1.0	.	.	.	.	.
27	.	3.1	1.0	.	2.5	7.9	6.1	0.5	.	.	.	6.4	.
28	3.6	5.1	5.6	14.5	4.8	4.1	7.6	17.3	.	2.0	0.8	7.9	.
29	0.5	0.5	6.9	6.6	3.0	3.6	13.8	41.4	26.2	29.5	41.9	34.0	58.7
30	6.1	9.4	5.8	3.4	.	.	6.9	0.5	13.2	13.7	0.5	17.0	.
31	.	.	24.1	0.3	.	.	.	.	.	.	.	.	.
Tot.	579.2	526.7	508.5	767.3	543.0	528.2	733.4	692.3	1041.3	1204.6	1032.2	621.7	893.9

Table B.6.23 Daily Rainfall (1) Aug. 1974

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga — Aug. 1974

No.	10	11	12	14	15	16	17	18	19	21	22	23	24
Day \ Gaug Station	Pantabangan Dam	TRIS Dam Tayabo	Canuacuesm San Jose City	Tondod San Jose City	PRIS Dam	Baloc Sto. Domingo	LTRIS Dam	Sibul	Pinahan Gen. Natividad	Hurcon Dam	PBRIS Dam Afate	Bantuk	Quezon
1	.	0.8	0.8	2.3	1.0	.	2.3	3.5	.	4.1	4.3	3.3	1.0
2	.	1.8	2.0	0.8	2.0	.	1.3	1.0	6.8	1.5	-	.	.
3	.	1.3	13.2	37.3	5.8	.	18.0	20.3	1.3	2.3	.	2.8	2.0
4	8.9	6.9	11.0	43.0	14.2	.	4.6	3.6	30.0	4.9	18.8	5.1	21.6
5	5.8	4.6	.	-	0.3	.	.	-	1.3	1.3	.	.	0.8
6	2.8	2.6	28.2	14.0	2.5	.	1.8	2.0	3.1	3.3	2.3	1.3	.
7	9.4	48.8	28.4	6.1	0.3	.	15.0	1.3	.	8.4	.	1.5	4.3
8	6.1	27.7	10.4	9.9	4.5	.	3.8	6.1	2.3	5.1	3.1	14.7	8.9
9	6.9	38.4	17.6	16.5	7.1	.	6.1	3.1	3.3	3.3	7.4	4.9	5.6
10	.	34.6	73.7	50.6	38.1	.	34.5	24.9	17.3	15.5	6.1	20.1	11.5
11	.	1.8	0.3	0.5	.	.	.	0.3	0.5	3.1	1.3	1.8	9.9
12	3.8	43.0	26.4	17.3	21.6	.	17.3	13.5	1.3	2.0	3.8	18.8	2.8
13	0.5	32.8	36.3	38.4	17.0	.	45.2	23.9	41.7	30.0	48.0	10.7	15.5
14	.	17.8	17.3	15.2	28.5	.	12.0	23.7	14.7	17.2	15.8	19.1	20.1
15	29.4	129.5	112.2	126.0	111.0	.	106.9	152.9	123.7	124.7	79.5	114.9	148.3
16	25.4	138.6	85.9	92.0	122.2	.	129.6	171.0	142.2	173.0	89.7	173.7	157.5
17	.	56.4	96.3	55.4	67.0	.	57.5	59.7	54.1	54.1	30.2	43.4	42.7
18	2.5	18.1	8.9	0.8	0.5	.	0.8	-	5.3	.	.	0.3	.
19	16.3	11.4	3.6	5.3	3.3	.	4.8	4.4	-	4.8	.	2.3	3.0
20	50.8	31.7	7.4	12.5	29.5	.	14.7	11.0	.	16.0	16.5	16.8	12.4
21	61.5	35.3	5.6	3.8	18.3	.	10.2	27.9	4.6	12.5	1.2	17.5	15.8
22	3.8	2.8	1.3	0.5	6.1	.	.	.	.	.	2.0	.	.
23	6.4	21.3	19.4	11.0	39.4	.	21.6	22.6	38.3	3.1	.	9.4	17.5
24	1.0	48.0	26.4	28.2	17.3	.	18.0	36.9	12.0	18.0	16.0	12.0	23.9
25	15.5	.	3.1	0.3	2.0	.	4.6	2.1	0.8	.	0.8	.	0.5
26	19.9	1.3	.	.	10.7	.	5.8	3.3	2.0	7.1	.	.	.
27	28.0	2.3	6.6	4.6	3.6	.	2.5	7.1	11.9	3.3	8.4	16.0	.
28	9.9	4.3	2.0	2.0	8.9	.	6.6	3.6	4.1	9.2	5.8	10.2	5.3
29	.	2.5	9.1	88.6	78.5	.	47.0	3.6	15.0	1.3	2.5	0.5	.
30	.	-	.	.	1.8	.	.	.	.	.	5.6	.	2.0
31	6.9	.	.	5.8	2.5	.	1.0	15.8	1.8	14.2	16.3	4.4	7.1
Tot.	321.5	766.4	653.4	688.7	665.2	.	595.5	448.6	535.4	549.8	385.5	525.5	540.0

Table B.6.25 Daily Rainfall (3) Aug. 1974

Monthly summary of daily rainfall (mm)
at different stations

River System : Pampanga

1974

No.	56	60
Day \ Gauging Station	Malolos	Minuyan
1	0.5	0.3
2	0.2	28.4
3	0.5	2.8
4	1.8	8.4
5	.	0.3
6	.	0.8
7	0.5	16.8
8	1.5	27.9
9	3.0	40.2
10	32.2	87.3
11	17.0	28.4
12	25.2	16.6
13	40.1	36.1
14	36.3	86.6
15	15.8	180.6
16	.	272.3
17	.	158.5
18	.	10.0
19	.	47.0
20	.	25.4
21	.	10.4
22	.	.
23	.	11.0
24	.	3.1
25	.	.
26	.	6.1
27	0.8	.
28	0.2	.
29	0.2	34.1
30	.	21.1
31	.	.
Total	175.8	1156.5

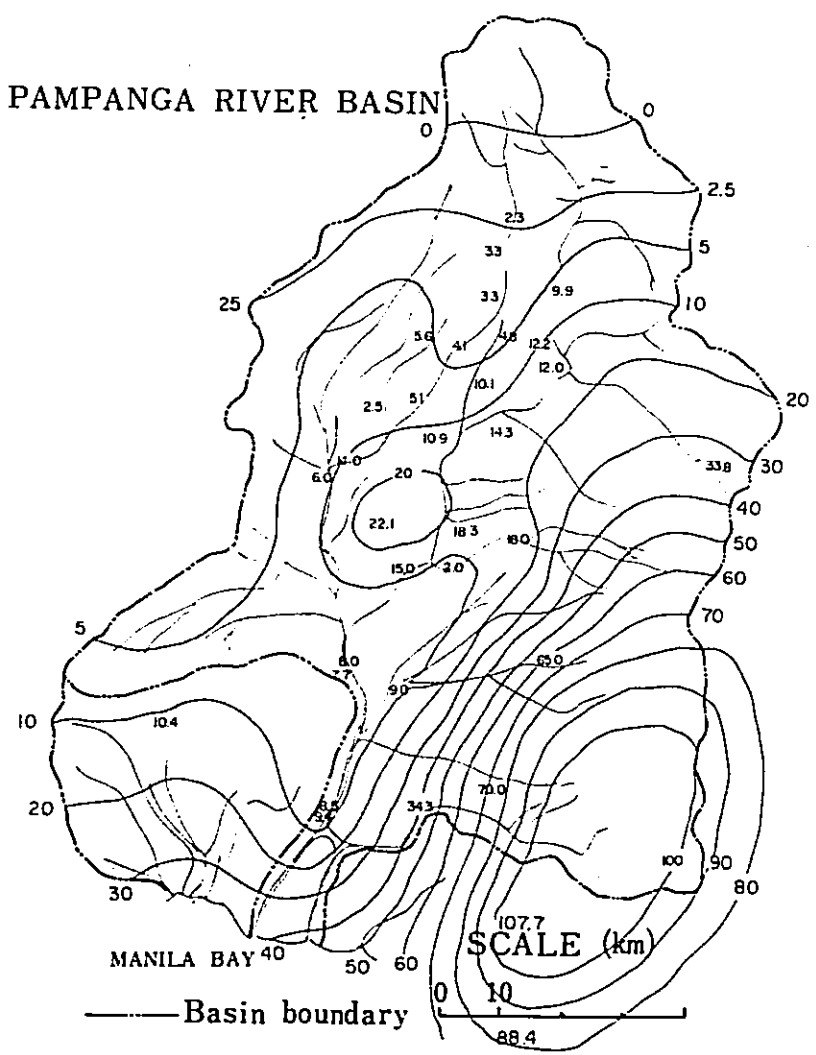


Fig. B.6.6 Isohyetal Map June 9, 1974

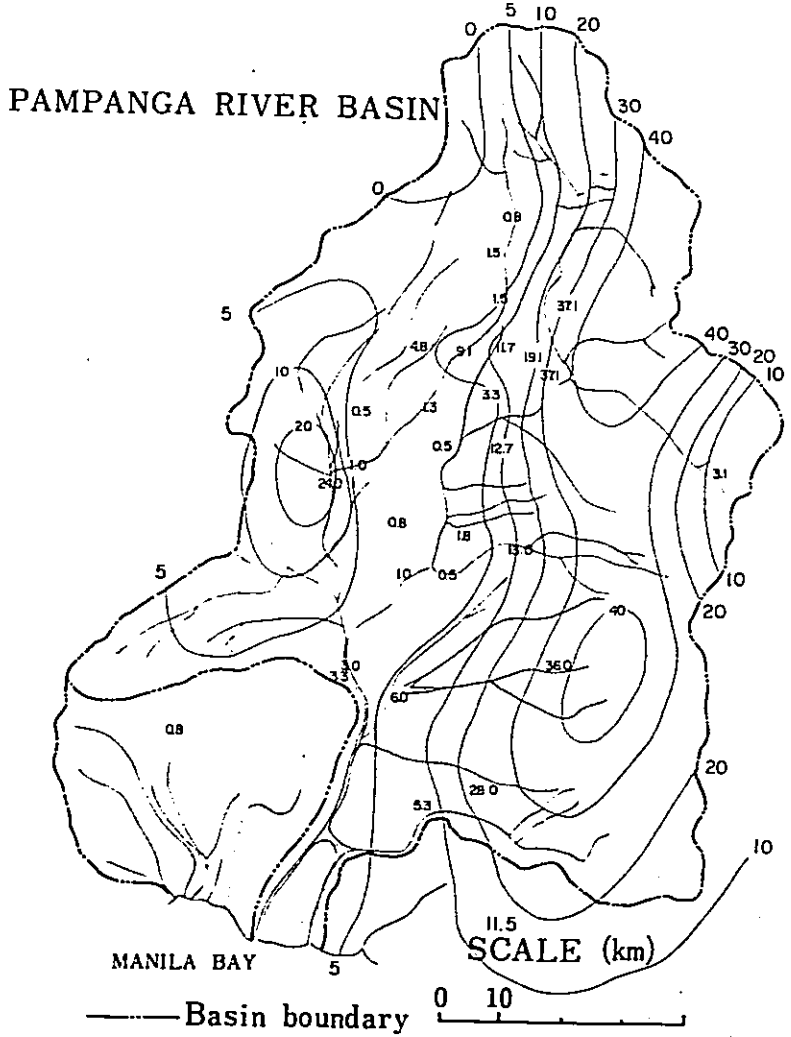


Fig. B.6.5 Isohyetal Map June 8, 1974

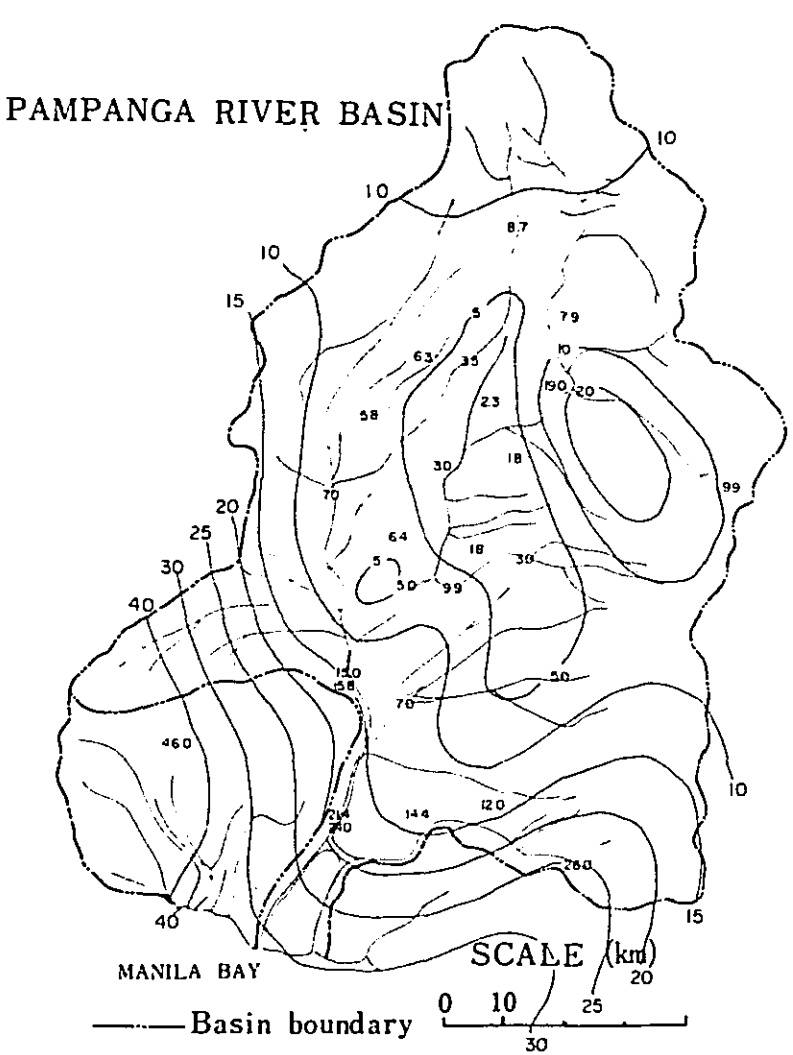


Fig. B.6.8 Isohyetal Map June 11, 1974

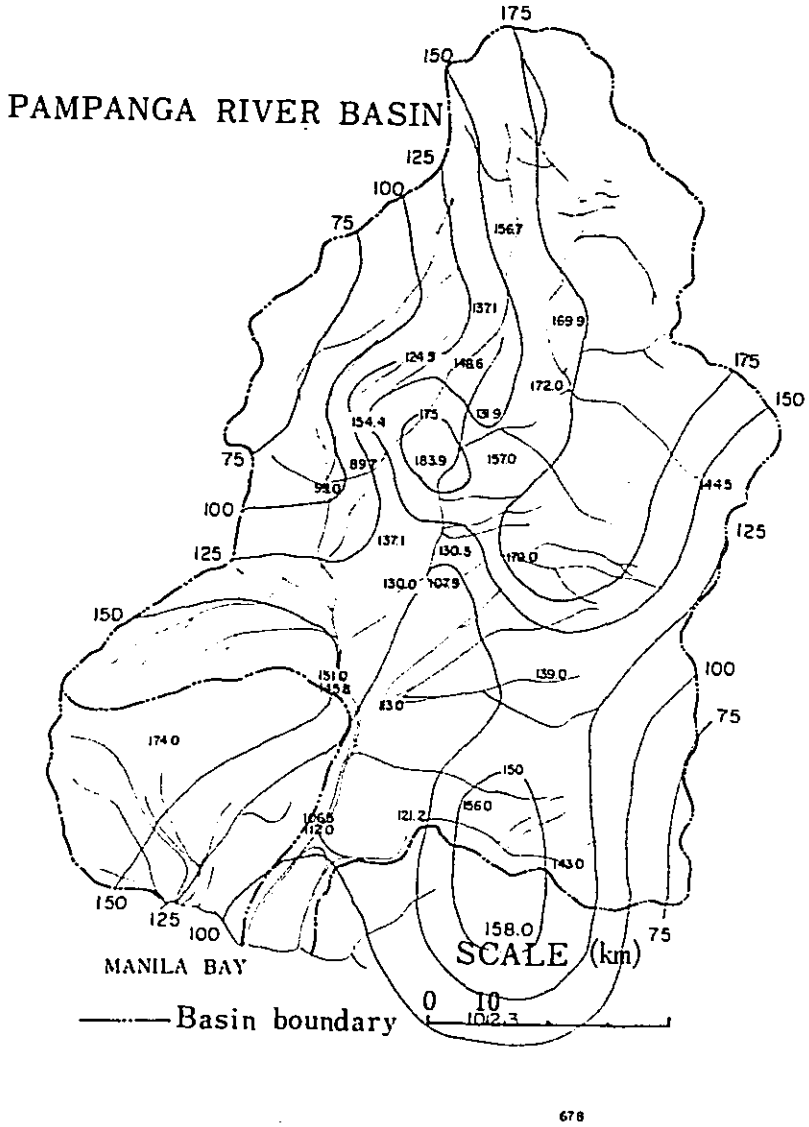


Fig. B.6.7 Isohyetal Map June 10, 1974

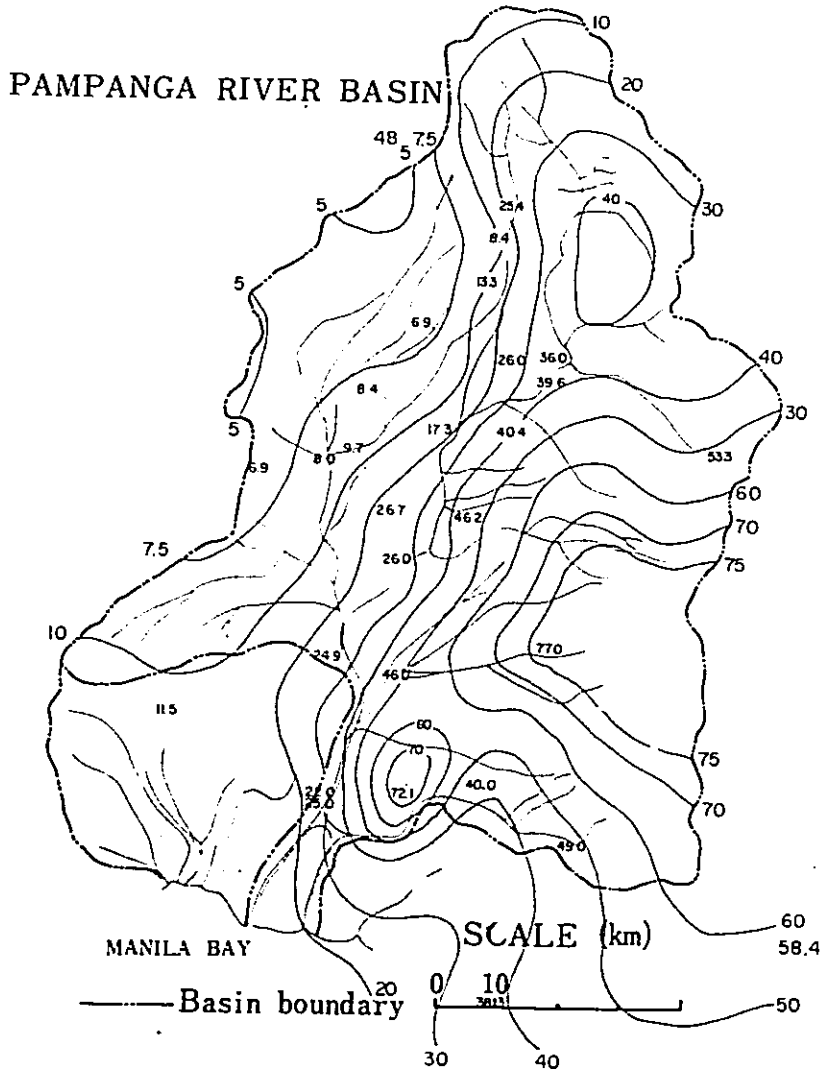


Fig. B.6.10 Isohyetal Map July 19, 1974

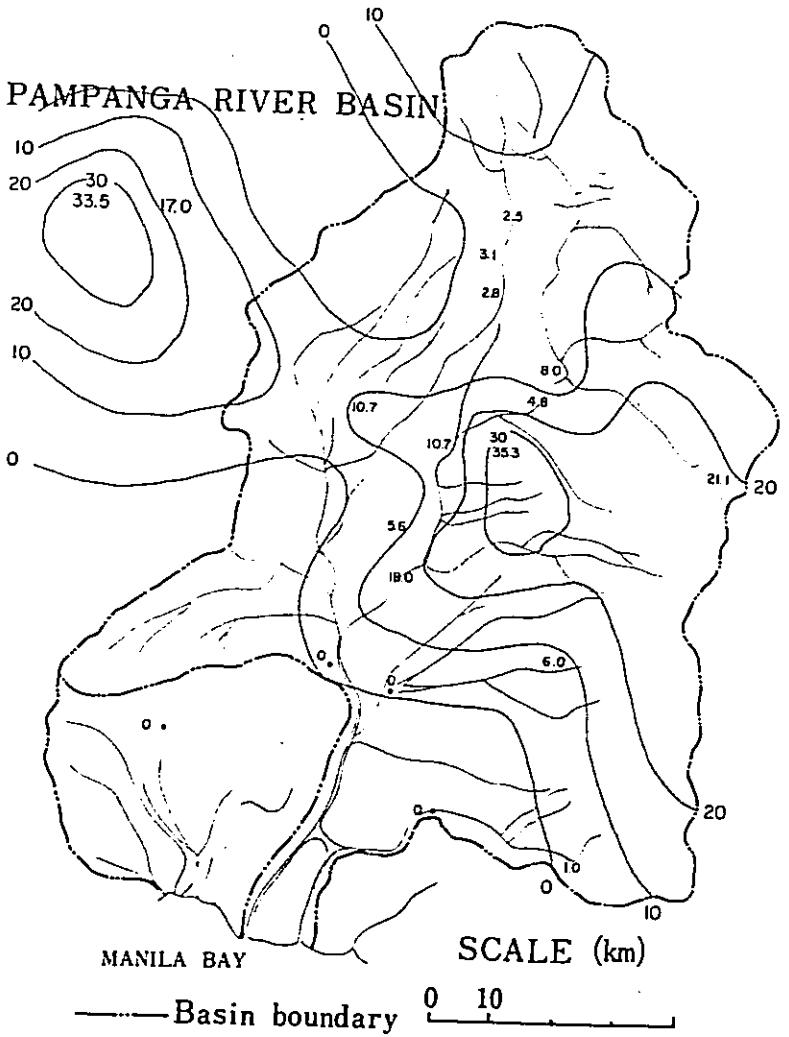


Fig. B.6.9 Isohyetal Map July 18, 1974

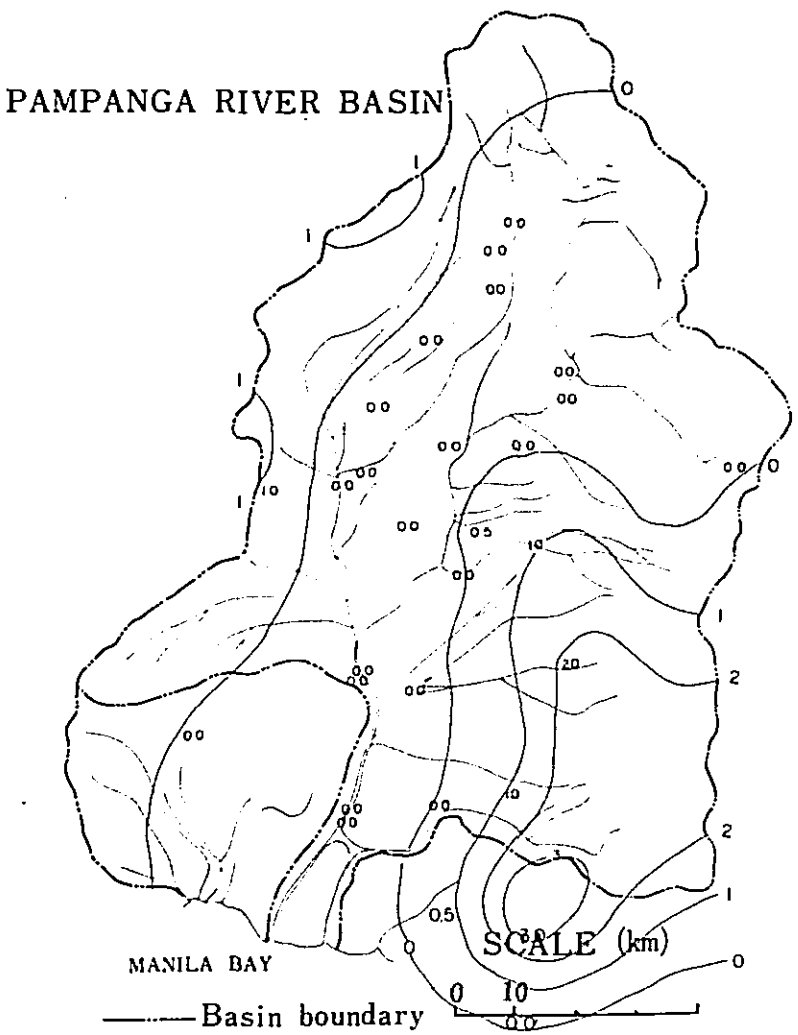


Fig. B.6.12 Isohyetal Map July 21, 1974

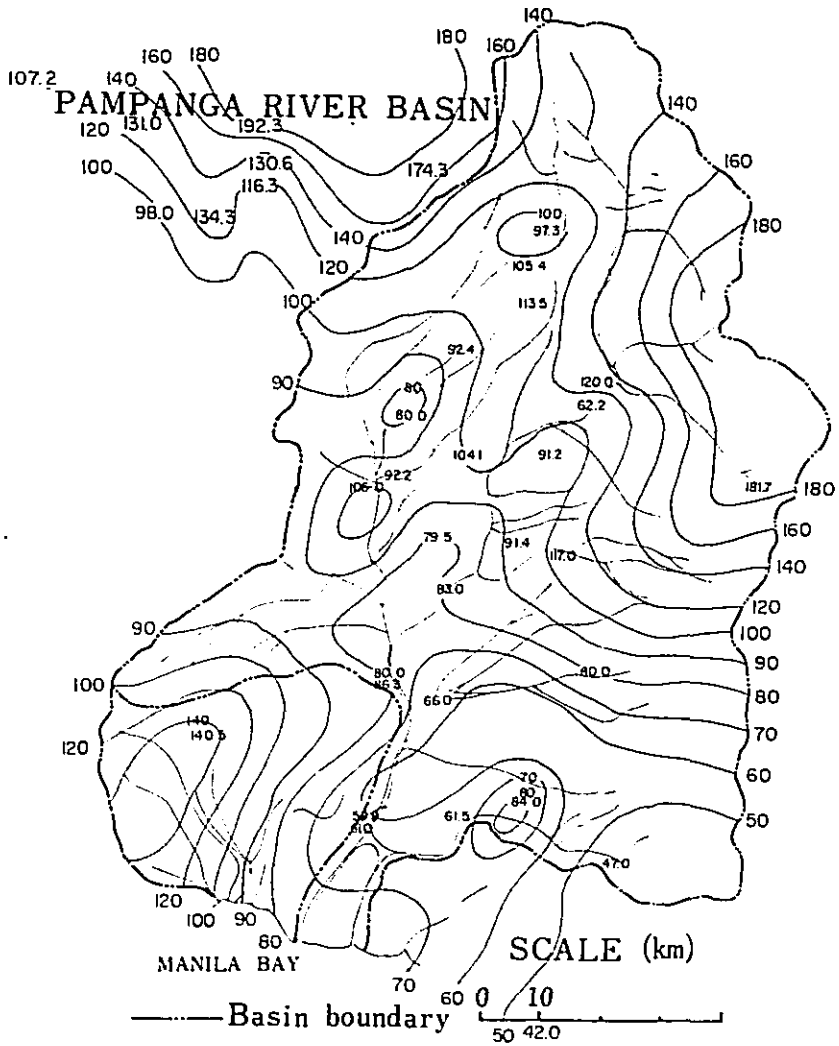


Fig. B.6.11 Isohyetal Map July 20, 1974

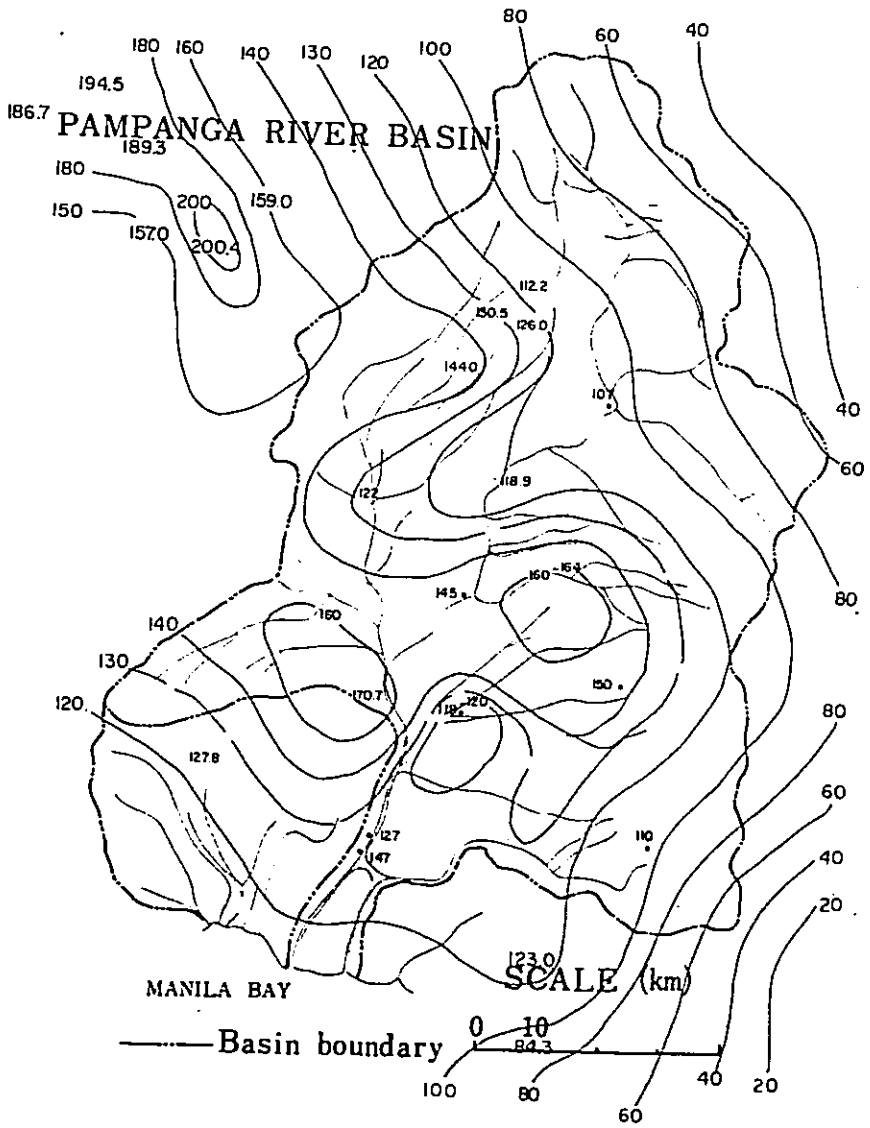


Fig. B.6.14 Isohyetal Map Aug. 15, 1974

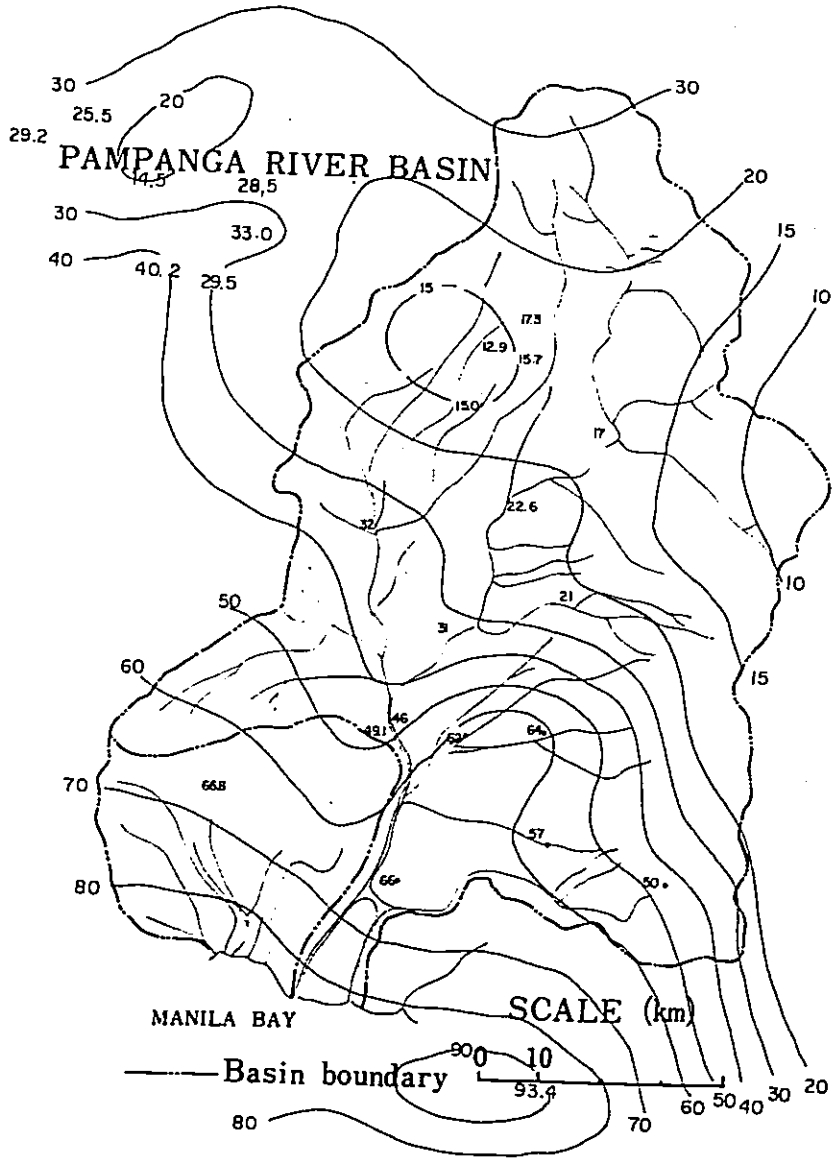


Fig. B.6.13 Isohyetal Map Aug. 14, 1974

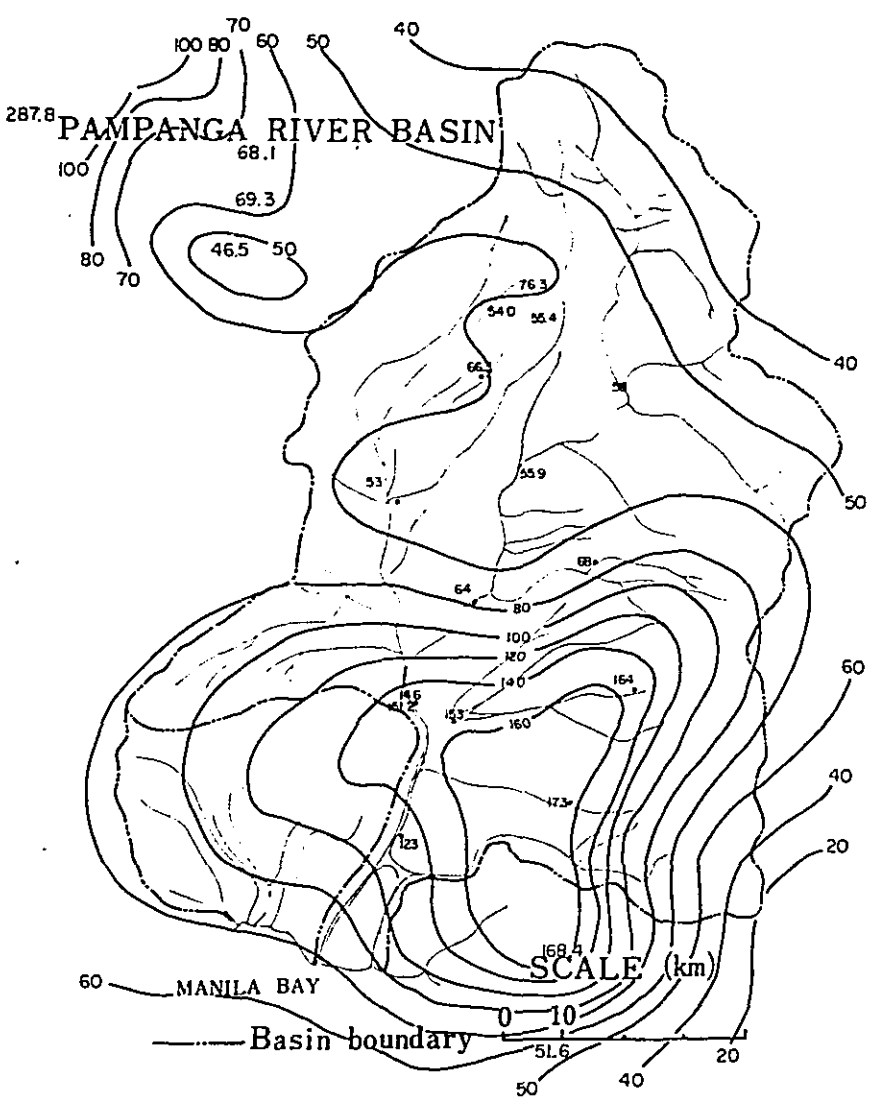


Fig. B.6.16 Isohyetal Map Aug. 17, 1974

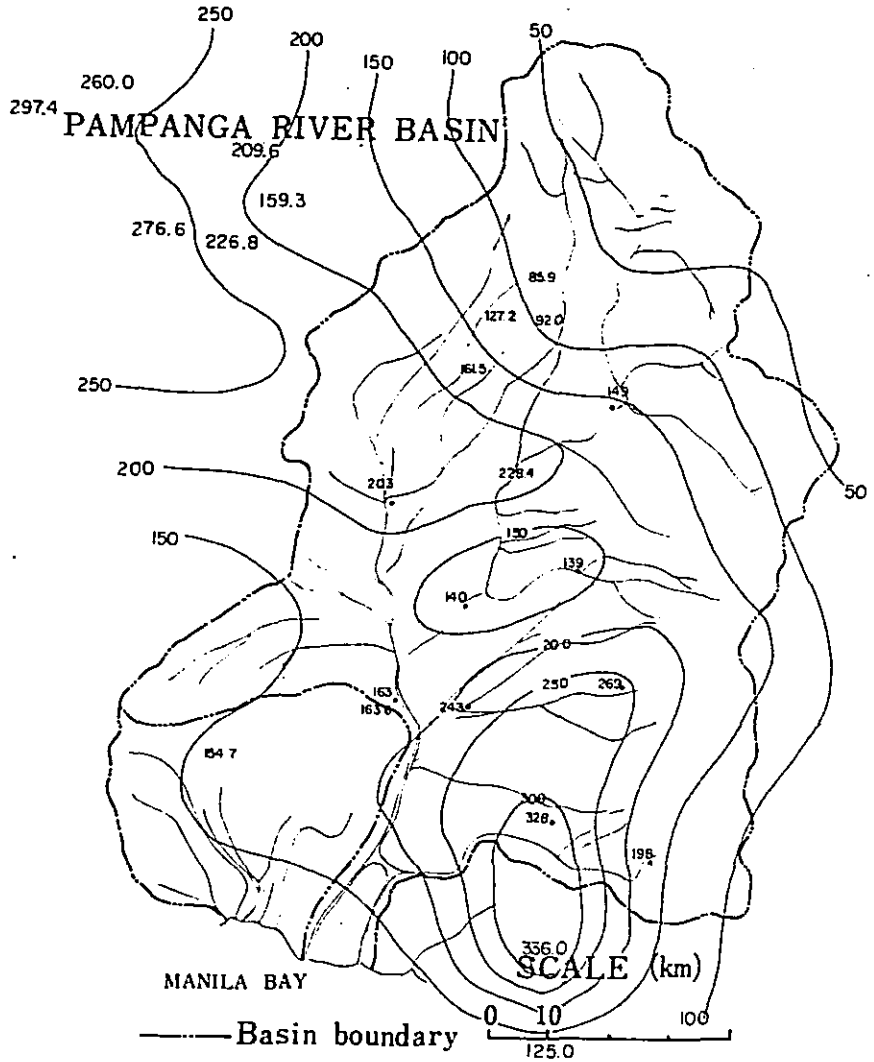


Fig. B.6.15 Isohyetal Map Aug. 16, 1974

Table B.6.27 River Gage Reading (1) Aug. 1974

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug 1974

No.	7		9		11		13		17		22		30	
Gaging Station	Coronel R.	Rangkerohan	Cabu R.	Cabu	Tabuating R.	Soledad	Chico R.	Ylog na Nuntl	Penaranda R.	Poblacion	Talavera R.	Cabobolomnan	San Miguel R.	San Vicente
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1														
2														
3														
4														
5														
6														
7														
8														
9														
10											7 17	1.20 1.20		

Table B.6.26 Basin Daily Rainfall Aug. 1974

Monthly summary of basin daily rainfall (mm)

River System : Pampanga — Aug. 1974

Day	Gaging Station / Arithmetic Mean (10)	Whole Pampanga River System
1		
2		
3		
4		
5		
6		4.8
7		3.6
8		7.5
9		9.2
10		23.4
11		4.2
12		11.2
13		24.2
14		33.9
15		128.7
16		183.9
17		86.8
18		2.7
19		8.6
20		16.4
21		8.4
22		0.2
23		9.4
24		10.1
25		9.7
26		
27		
28		
29		
30		
31		
Total		586.9

Table B.6.29 River Gage Reading (3) Aug. 1974

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1974

No.	7		9		11		13		17		22		30	
Gaging Station	Coronel R.	Bangkerohan	Cabu R.	Cabu	Tabuating R.	Soledad	Chico R.	Ilog na Munti	Penaranda R.	Poblacion	Talavera R.	Cabobloonan	San Miguel R.	San Vicente
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21	7	2.24	7	1.78	7	4.00	7	1.80	7	3.50			7	6.30
	17	2.15			17	3.00	17	1.74	12	3.50			12	19.74
									17	3.50			17	5.30
22	7	2.10			7	3.70			7	3.50	7	2.00	7	6.30
	17	1.99			17	3.20			12	3.50	17	2.00	12	19.41
									17	3.40			17	5.30
23	7	1.89	7	1.25	7	4.00	7	1.61	7	3.50			7	6.30
	17	1.87			17	3.60	17	1.61	12	3.50			12	19.34
									17	3.40			17	5.30
24	7	1.88			7	3.30			7	3.40	7	1.86	7	6.30
	17	1.90			17	3.00			12	3.40	17	1.86	12	19.10
									17	3.40			17	5.30
25	7	1.96							7	3.40				
	17	2.04							12	3.40				
									17	3.40				
26	7	2.09	7	1.00										
	17	2.07												
27	7	2.06												
	17	1.94												
28	7	1.88	7	0.99										
	17	1.84												
29	7	1.80												
	17	1.75												
30	7	1.73	7	0.98										
	17	1.69												
31	7	1.65												
	17	1.67												

Table B.6.28 River Gage Reading (2) Aug. 1974

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1974

No.	7		9		11		13		17		22		30	
Gaging Station	Coronel R.	Bangkerohan	Cabu R.	Cabu	Tabuating R.	Soledad	Chico R.	Ilog na Munti	Penaranda R.	Poblacion	Talavera R.	Cabobloonnn	San Miguel R.	San Vicente
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11														
12											7	2.00		
											17	2.00		
13														
14	7	1.53	7	1.00	7	3.00	7	1.25					7	6.30
	17	1.56			17	3.60	17	1.27					12	18.80
													17	5.30
15	7	1.58			7	4.00			7	2.60	7	1.90	7	6.30
	17	1.59			17	5.00			12	2.60	17	1.90	12	19.90
									17	3.20			17	5.30
16	7	1.84	7	3.00	7	8.00	7	2.99	7	4.80			7	6.30
	17	1.88			17	8.00			12	4.90			12	21.95
									17	5.10			17	5.30
17	7	2.34			7	8.00			7	5.50	7	1.60	7	6.30
	17	2.24			17	8.00			12	5.80	17	1.60	12	22.84
									17	5.90			17	5.30
18	7	2.59	7	3.00	7	4.20			7	6.07			7	6.30
	17	2.34			17	4.00			12	5.97			12	22.40
									17	5.70			17	5.30
19	7	1.97			7	3.60	7	1.84	7	3.96	7	1.60	7	6.30
	17	2.28			17	3.30	17	1.84	12	3.92	17	1.60	12	20.60
									17	3.90			17	5.30
20	7	2.13			7	3.00			7	3.56			7	6.30
	17	2.11			17	5.00			12	3.52			12	20.00
									17	3.50			17	5.30

Table B.6.31 River Gage Reading (5) Aug. 1974

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1974

No.	35		37		38		46		48		49		54	
Gaging Station	Pampanga R.	Pasig	Masaim R.	Bahay Pare	Pampanga R.	Sta. Cruz	Angat R.	Longos	Angat R.	Pungo	Pampanga R.	Poblacion	Labangan R.	Bagbag
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
11														
12														
13														
14	7 12.30										7 12.00			
	12 12.44										12 12.08			
	17 12.10										17 12.09			
15	7 12.90		7 4.60		7 12.70		7 2.84		7 2.82		7 13.20		7 12.10	
	12 13.00		17 4.80		17 13.00		12 3.25		12 2.99		12 15.20		12 12.08	
	17 14.20				17 13.00		17 4.30		17 2.88		17 15.00		17 12.11	
16	7 14.52		7 4.90		7 15.00		7 4.30		7 3.88		7 16.80		7 13.20	
	12 14.60		17 4.95		12 15.02		12 6.00		12 4.15		12 14.90		12 13.18	
	17 16.90				17 15.56		17 6.70		17 5.04		17 14.90		17 14.06	
17	7 15.70		7 5.20		7 15.35		7 over		7 5.78		7 15.00		7 14.70	
	12 16.62		17 5.40		12 16.36		12 over		12 5.77		12 15.20		12 14.82	
	17 16.62				17 16.86		17 6.70		17 5.91		17 15.20		17 14.86	
18	7 16.58		7 5.60		7 17.40		7 6.30		7 6.51		7 15.20		7 15.28	
	12 16.62		17 5.45		12 17.50		12 5.50		12 6.63		12 15.56		12 15.40	
	17 16.62				17 17.60		17 5.35		17 6.70		17 15.60		17 15.48	
19	7 16.48		7 5.00		7 17.50		7 5.30		7 6.66		7 15.50		7 15.40	
	12 16.38		17 4.90		12 17.40		12 5.20		12 6.53		12 15.70		12 15.32	
	17 16.28				17 17.28		17 4.95		17 6.26		17 15.80		17 15.20	
20	7 16.10		7 4.85		7 16.86		7 4.20		7 5.87		7 16.22		7 14.82	
	12 16.05		17 4.83		12 16.70		12 4.44		12 5.86		12 16.08		12 14.23	
	17 16.00				17 16.60		17 4.60		17 5.26		17 16.10		17 14.80	

Table B.6.30 River Gage Reading (4) Aug. 1974

10-day summary of river-gage reading
at different stations

River System : Pampanga — Aug. 1974

No.	35		37		38		46		48		49		54	
Gaging Station	Pampanga R.	Pasig	Masaim R.	Bahay Pare	Pampanga R.	Sta. Cruz	Angat R.	Longos	Angat R.	Pungo	Pampanga R.	Poblacion	Labangan R.	Bagbag
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

Table B.6.33 Hourly Gage Height June 3, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga June 3 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.03	0.08	6.76	9.25	0.82	0.14	0.08	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.32 River Gage Reading (6) Aug. 1974

10-day summary of river-gage reading
at different stations

River System : Pampanga Aug. 1974

No.	35		37		38		46		48		49		54	
Gaging Station	Pampanga R.	Pasig	Hasmin R.	Bahay Pare	Pampanga R.	Sta. Cruz	Angat R.	Longos	Angat R.	Pungo	Pampanga R.	Poblacion	Labangan R.	Reping
Day	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)	Time	Gage Height (m)
21	7	15.90	7	4.90	7	16.36	7	3.98	7	5.46	7	14.44	7	14.55
	12	15.85	17	5.00	12	16.30	12	3.97	12	5.36	12	13.40	12	14.48
	17	15.80	.	.	17	16.40	17	3.96	17	5.27	17	13.39	17	14.40
22	.	.	7	5.10	7	16.20	7	3.88	7	5.20	7	14.70	7	14.30
	.	.	17	5.15	12	16.20	12	3.78	12	5.05	12	13.40	12	14.22
	.	.	.	.	17	16.20	17	3.76	17	4.98	17	13.35	17	14.12
23	.	.	7	5.80	7	16.10	7	3.60	7	4.80	7	13.68	7	14.00
	.	.	17	4.80	12	16.10	12	3.40	12	4.70	12	13.35	12	13.93
	.	.	.	.	17	16.08	17	3.30	17	4.60	17	13.30	17	13.74
24	.	.	7	4.60	7	16.00	7	3.42	7	4.46	7	13.65	7	13.62
	.	.	17	4.80	12	15.78	12	3.32	12	4.30	12	13.30	12	13.54
	.	.	.	.	17	15.60	17	3.28	17	4.28	17	13.28	17	13.42
25	.	.	7	4.25	7	15.56	7	3.00	7	4.26	.	.	7	13.56
	.	.	17	4.20	12	15.52	12	2.90	12	4.20	.	.	12	13.38
	.	.	.	.	17	15.54	17	2.76	17	4.15	.	.	17	13.26
26														
27														
28														
29														
30														
31														

Table B.6.35 Hourly Gage Height June 5, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga — June 5 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ishidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Solipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	0.04	0.39	7.65	9.36	1.40	0.87	0.77	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	0.04	0.36	7.68	9.49	1.49	.	1.10	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.04	0.34	7.82	9.49	1.61	0.64	0.93	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.11	0.28	8.15	9.57	1.58	0.74	0.37	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.34 Hourly Gage Height June 4, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga — June 4 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ishidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Solipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	0.04	0.16	6.98	9.24	0.98	0.54	0.83	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.04	0.14	6.99	9.33	1.25	.	0.81	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.04	0.14	7.18	9.34	1.19	0.24	0.27	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.37 Hourly Gage Height June 7, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga June 7 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	0.04	0.24	7.87	9.97	1.47	–	0.30	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0.04	0.24	7.87	9.97	1.47	.	0.45	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.04	0.24	7.84	2.96	1.56	.	1.04	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.04	0.19	7.87	2.95	1.51	–	0.44	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	0.04	0.19	7.90	2.95	1.43	4.24	0.23	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.36 Hourly Gage Height June 6, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga June 6 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	–	0.25	–	9.63	1.51	–	0.29	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0.13	0.24	8.36	9.70	1.49	–	0.73	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.10	0.24	8.21	9.83	1.65	–	1.00	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	–	0.24	8.09	9.93	1.60	–	0.48	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.39 Hourly Gage Height June 9, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga June 9 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ishidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	0·11	0·33	7·77	2·92	1·37	—	0·62	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0·18	0·31	7·74	2·92	1·46	.	1·08	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	0·14	0·30	7·71	2·92	1·52	.	0·80	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	.	.	.	.	.	.	.	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	0·14	0·28	7·62	2·93	1·47	.	0·26	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.38 Hourly Gage Height June 8, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga June 8 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ishidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0·03	0·17	7·97	2·92	1·33	—	0·55	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	—	0·29	—	2·91	1·46	—	1·04	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	—	0·22	—	2·91	1·42	—	0·42	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.41 Hourly Gage Height June 11, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga June 11 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Bulio	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	5.22	2.79	7.76	3.11	2.54	6.74	0.95	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	3.93	3.88	8.02	3.37	2.66	6.85	1.26	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	3.22	4.11	8.50	3.90	2.76	6.46	1.66	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	2.61	4.08	8.36	4.43	2.96	6.48	2.07	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	2.24	4.11	10.11	–	3.16	6.54	2.36	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	1.94	4.08	10.54	–	3.34	1.44	2.43	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1.74	3.99	10.80	5.24	3.51	0.94	2.44	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	1.51	3.71	10.99	5.37	3.68	0.76	2.44	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.40 Hourly Gage Height June 10, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga June 10 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Bulio	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0.21	0.53	7.55	2.93	1.56	–	0.58	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	0.24	0.71	7.53	2.93	1.69	–	0.96	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.30	0.77	7.53	2.94	1.84	0.76	1.35	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	2.43	0.90	7.53	2.96	1.96	6.44	1.16	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	3.86	1.64	7.56	2.99	2.10	2.87	0.93	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.43 Hourly Gage Height June 13, 1974

Daily summary of hourly gage height (m) at different stations

River System : Pampanga June 13 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	—	1.72	—	6.33	4.64	0.37	1.88	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	—	1.85	—	6.11	4.67	0.26	1.71	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	—	1.82	—	6.07	4.68	0.26	1.65	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.92	1.89	11.34	5.90	4.70	0.26	1.58	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.42 Hourly Gage Height June 12, 1974

Daily summary of hourly gage height (m) at different stations

River System : Pampanga June 12 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1.40	3.30	11.12	8.65	3.84	0.65	2.47	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	1.32	2.85	11.22	8.57	4.02	0.56	2.48	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1.24	2.79	11.28	8.47	4.19	0.54	2.43	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	1.10	2.69	11.35	8.38	4.30	0.44	2.24	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	1.01	2.44	11.39	7.09	4.35	0.36	2.19	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	1.11	2.25	11.43	7.00	4.44	0.49	2.07	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1.01	2.12	11.45	6.90	4.49	0.84	2.13	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.45 Hourly Gage Height June 15, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga June 15 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0.82	1.74	11.16	5.68	4.71	0.26	1.52	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.61	1.44	10.81	5.56	4.72	0.26	1.52	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.44 Hourly Gage Height June 14, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga June 14 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	0.81	1.95	11.27	5.78	4.71	0.26	1.53	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0.82	1.74	11.16	5.68	4.71	0.26	1.52	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.61	1.44	10.81	5.56	4.72	0.26	1.52	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.47 Hourly Gage Height July 21, 1974

Daily summary of hourly gage height (m) at different stations

River System : Pampanga — July 21 1974

Time \ Gaging Station	No. 58 Pampanga R. Sapang Buho	59 Pampanga R. San Ildidro	60 Rio Chico R. Zaragoza	61 Pampanga R. San Agustin, Arayat	62 Candaba Swamp Candaba	63 Angat R. Ipo	64 Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	5·01	4·39	9·80	3·07	3·46	—	1·75	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	3·41	6·73	10·30	6·22	3·65	—	2·10	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	2·94	6·99	10·57	6·68	3·85	—	2·31	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	2·50	—	10·80	6·91	4·02	0·84	2·54	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	2·20	—	10·99	7·09	4·22	0·74	2·61	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	1·79	—	11·14	7·12	4·36	0·66	2·33	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1·82	6·88	11·32	7·18	4·50	—	2·60	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	1·70	6·51	11·44	7·16	4·67	.	2·57	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.46 Hourly Gage Height June 20, 1974

Daily summary of hourly gage height (m) at different stations

River System : Pampanga — July 20 1974

Time \ Gaging Station	No. 58 Pampanga R. Sapang Buho	59 Pampanga R. San Ildidro	60 Rio Chico R. Zaragoza	61 Pampanga R. San Agustin, Arayat	62 Candaba Swamp Candaba	63 Angat R. Ipo	64 Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	0·90	1·34	8·38	—	2·84	0·54	0·63	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	0·84	1·39	8·39	—	2·86	1·74	0·65	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0·90	1·55	8·40	—	2·89	1·46	1·08	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	0·92	1·72	8·42	—	2·92	1·44	1·50	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	2·04	1·85	8·46	2·38	2·98	2·29	1·48	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	6·59	7·63	8·68	2·61	3·12	2·25	1·35	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	—	3·16	9·00	2·45	3·20	1·78	1·27	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	4·11	3·95	9·39	2·60	3·31	1·44	1·41	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.49 Hourly Gage Height July 23, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga July 23 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipu	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1:13	2:17	12:52	6:74	5:12	.	2:01	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	2:09	12:54	6:68	5:12	.	2:01	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1:04	2:04	12:54	6:62	5:13	.	2:01	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	1:00	1:91	12:53	6:56	5:13	.	2:00	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0:94	1:04	12:52	6:50	5:11	.	2:00	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	0:93	1:85	12:49	6:45	5:12	0:24	2:00	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0:93	1:78	12:47	6:39	5:10	0:29	2:00	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	0:84	1:74	12:42	6:34	5:10	0:29	1:99	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.48 Hourly Gage Height, July 22, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga July 22 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipu	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1:59	2:78	11:57	7:12	4:80	—	2:22	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	1:50	3:38	11:71	7:07	4:91	.	1:99	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1:43	2:86	11:86	7:01	4:89	.	1:91	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	1:34	2:92	12:02	6:97	5:06	.	1:90	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	1:30	2:77	12:16	6:83	5:10	.	1:93	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	1:23	2:56	12:29	6:89	5:13	.	2:00	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1:22	2:39	12:41	6:84	5:13	.	2:01	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	—	2:26	12:48	6:78	5:13	.	2:01	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.51 Hourly Gage Height July 25, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga July 25 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	0.70	1.29	11.97	5.88	4.99	0.27	1.88	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	—	1.24	11.84	5.78	4.96	0.27	1.86	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	0.68	1.26	11.77	5.74	4.95	0.27	1.85	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.64	1.18	11.71	5.69	4.93	0.26	1.84	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.64	1.18	11.57	5.60	4.89	0.37	1.87	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.50 Hourly Gage Height July 24, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga July 24 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	0.84	1.64	12.38	6.28	5.09	0.27	1.88	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	0.83	1.59	12.34	6.23	5.09	0.27	1.97	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0.82	1.54	12.29	6.18	5.08	0.27	1.96	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	0.79	1.49	12.24	6.13	5.06	0.27	1.95	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.74	1.45	12.19	6.08	5.05	0.27	1.94	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.73	1.35	12.09	5.98	5.02	0.27	1.91	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.53 Hourly Gage Height Aug. 14, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 14 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1.00	–	10.74	3.01	3.14	1.49	1.05	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1.00	1.25	10.75	3.04	3.17	1.45	1.11	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.94	1.39	10.76	3.06	3.20	2.45	1.14	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	0.92	1.44	10.79	3.11	3.24	1.67	1.17	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.90	1.44	10.81	3.14	3.25	1.49	1.19	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.52 Hourly Gage Height Aug. 13, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 13 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	0.64	0.88	10.65	2.87	3.08	0.75	1.03	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0.64	0.84	10.63	2.90	3.02	0.65	1.07	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.50	–	10.66	2.94	3.06	0.64	1.10	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	0.82	–	10.71	2.99	3.11	1.44	1.05	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.55 Hourly Gage Height Aug. 16, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 16 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Isidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	2.52	2.85	11.35	3.50	3.96	1.79	1.93	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	2.87	3.89	11.56	3.80	4.35	3.56	2.13	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	2.83	3.88	11.69	4.05	4.65	0.67	2.27	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	2.94	4.25	11.89	4.30	4.95	2.89	2.42	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	3.03	4.57	12.16	4.53	5.27	3.28	2.59	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	3.24	4.86	12.52	4.77	5.55	2.67	2.78	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	3.32	5.05	12.90	5.03	5.82	3.67	3.35	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.54 Hourly Gage Height Aug. 15, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 15 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Isidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	0.90	1.35	10.86	3.21	3.31	1.44	1.23	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	0.84	1.36	10.96	3.27	3.41	1.65	1.34	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	0.90	1.44	11.03	3.34	3.51	1.74	1.53	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	1.02	1.48	11.08	3.37	3.60	1.79	1.61	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1.22	1.79	11.18	3.41	3.71	2.44	1.72	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.57 Hourly Gage Height Aug. 18, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 18 1974

No.	58	59	60	61	62	63	64
Time \ Gaging Station							
1	.	.	.	.	.	.	.
2	3.44	6.16	13.73	8.71	7.68	2.44	5.03
3	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.
5	3.10	6.84	13.72	9.04	7.73	1.97	5.19
6	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.
8	2.64	6.75	13.69	9.30	7.80	1.84	5.32
9	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.
11	2.63	6.57	13.68	9.49	7.83	1.74	5.40
12	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.
14	2.40	5.38	13.61	9.64	7.84	1.65	5.47
15	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.
17	2.24	5.18	13.64	9.74	7.84	1.54	5.51
18	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.
20	2.12	5.84	13.51	9.74	7.84	1.47	5.54
21	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.
23	2.00	5.58	13.46	9.74	7.82	1.44	5.54
24	.	.	.	.	.	.	.

Table B.6.56 Hourly Gage Height Aug. 17, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 17 1974

No.	58	59	60	61	62	63	64
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit
1	.	.	.	.	.	.	.
2	3.34	5.14	13.20	5.40	6.07	0.57	3.67
3	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.
5	3.48	5.26	13.44	5.80	6.28	3.25	3.74
6	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.
8	3.44	5.46	13.59	6.21	6.55	2.88	3.85
9	.	.	.	.	.	.	.
10	3.20	6.65	13.67	6.64	6.81	3.47	3.98
11	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.
14	3.44	6.84	13.72	7.07	7.07	2.67	4.14
15	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.
17	5.70	6.06	13.74	7.49	7.29	3.85	4.39
18	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.
20	5.82	6.26	13.75	7.92	7.48	2.74	4.68
21	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.
23	5.50	6.34	13.74	8.33	7.59	2.44	4.84
24	.	.	.	.	.	.	.

Table B.6.59 Hourly Gage Height Aug. 20, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 20 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1·40	2·84	13·09	9·70	7·32	1·47	5·03	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	1·47	2·68	13·00	9·65	7·26	1·45	4·96	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1·40	2·57	12·96	9·59	7·21	1·49	4·90	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	1·34	2·54	12·93	9·52	7·14	1·44	4·83	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	1·34	2·44	(12·89)	9·46	7·11	1·59	4·79	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	1·34	2·44	12·86	9·41	7·04	1·46	4·73	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1·84	2·35	12·84	9·35	6·79	1·49	4·68	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	1·84	2·34	12·80	9·29	6·94	1·44	4·63	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.58 Hourly Gage Height Aug. 19, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 19 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1·94	4·18	13·41	9·78	7·78	1·47	5·54	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	1·84	3·75	13·36	9·75	9·74	1·44	5·52	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1·74	3·35	13·31	9·75	7·69	1·48	5·40	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	1·70	3·05	13·27	9·75	7·64	1·44	5·33	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	1·62	2·84	13·22	9·75	7·58	1·44	5·27	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	1·50	2·64	13·17	9·75	7·50	1·44	5·20	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1·53				7·45	1·44	5·14	.	.	.	.
21	.	2·86	13·11	9·75	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	1·50	2·62	13·09	9·75	7·40	1·44	5·09	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.61 Hourly Gage Height Aug. 22, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga

Aug. 22 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildifonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1:54	2:35	12:57	8.84	6.68	1.44	4.27	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	1:50	2:45	12:54	8.80	6.64	1.46	4.24	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1.44	2.48	12:52	8.75	6.60	1.44	4.21	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	1:40	2:45	12:50	8.71	6.56	0.99	4.16	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	1:30	2:38	12:48	8.67	6.53	0.97	4.12	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	1.34	2.34	12.47	8.63	6.48	0.94	4.08	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1:30	2:25	12:45	8.59	6.44	0.94	4.04	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	1.34	2.17	12.43	8.55	6.42	0.88	4.00	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.60 Hourly Gage Height Aug. 21, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga

Aug. 21 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildifonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1.60	2:35	12.77	9.24	6.90	1.44	4.58	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	1.50	2.54	12.74	9.18	6.86	1.49	4.53	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	1.54	2.68	12.71	9.13	6.85	1.44	4.48	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.
9	1.53	2.64	.	9.11	6.83	1.44	4.46	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	1.50	2.59	12.68	9.08	6.81	1.44	4.43	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	1.40	2.54	12.66	9.03	6.79	1.47	4.39	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	1.54	2.44	12.64	8.98	6.78	1.44	4.36	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1.44	2.35	12.62	8.94	6.75	1.44	4.32	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	1.60	2.34	12.60	8.89	6.71	1.44	4.30	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.63 Hourly Gage Height Aug. 24, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 24 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1.14	2.85	12.21	8.11	6.13	0.54	3.59	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1.10	2.84	12.16	8.00	6.07	0.45	3.52	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	1.04	2.84	12.09	7.90	6.03	0.44	3.44	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1.34	2.74	12.03	7.80	5.98	0.44	3.36	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.62 Hourly Gage Height Aug. 23, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 23 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildidro	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1.20	2.09	12.41	8.50	6.37	0.86	3.96	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	1.24	2.05	12.39	8.46	6.34	0.84	3.92	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1.20	2.04	12.37	8.41	6.32	0.84	3.87	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	1.10	2.04	12.34	8.36	6.25	0.44	3.81	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	1.14	2.04	12.35	8.32	6.25	0.56	3.76	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	1.14	2.04	12.33	8.30	6.24	0.55	3.74	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1.30	2.84	12.28	8.21	6.20	0.49	3.67	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.65 Hourly Gage Height Aug. 26, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 26 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1.43	2.34	11.75	7.40	5.76	0.39	3.06	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1.32	2.29	11.75	7.37	5.73	0.38	3.02	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1.20	2.15	11.76	7.33	5.69	0.39	2.94	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

Table B.6.64 Hourly Gage Height Aug. 25, 1974

Daily summary of hourly gage height (m)
at different stations

River System : Pampanga Aug. 25 1974

No.	58	59	60	61	62	63	64				
Time \ Gaging Station	Pampanga R. Sapang Buho	Pampanga R. San Ildefonso	Rio Chico R. Zaragoza	Pampanga R. San Agustin, Arayat	Candaba Swamp Candaba	Angat R. Ipo	Pampanga R. Sulipan, Apalit				
1	.	.	.	.	.	.	.	.	.	.	.
2	1.24	2.24	11.97	7.71	5.92	0.39	3.30	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.
8	1.30	2.34	11.90	7.61	5.87	0.45	3.24	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.
14	1.30	2.04	11.83	7.52	5.84	0.54	3.19	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.
19	.	.	.	.	.	.	.	.	.	.	.
20	1.40	2.08	11.77	7.46	5.80	0.39	3.12	.	.	.	.
21	.	.	.	.	.	.	.	.	.	.	.
22	.	.	.	.	.	.	.	.	.	.	.
23	.	.	.	.	.	.	.	.	.	.	.
24	.	.	.	.	.	.	.	.	.	.	.

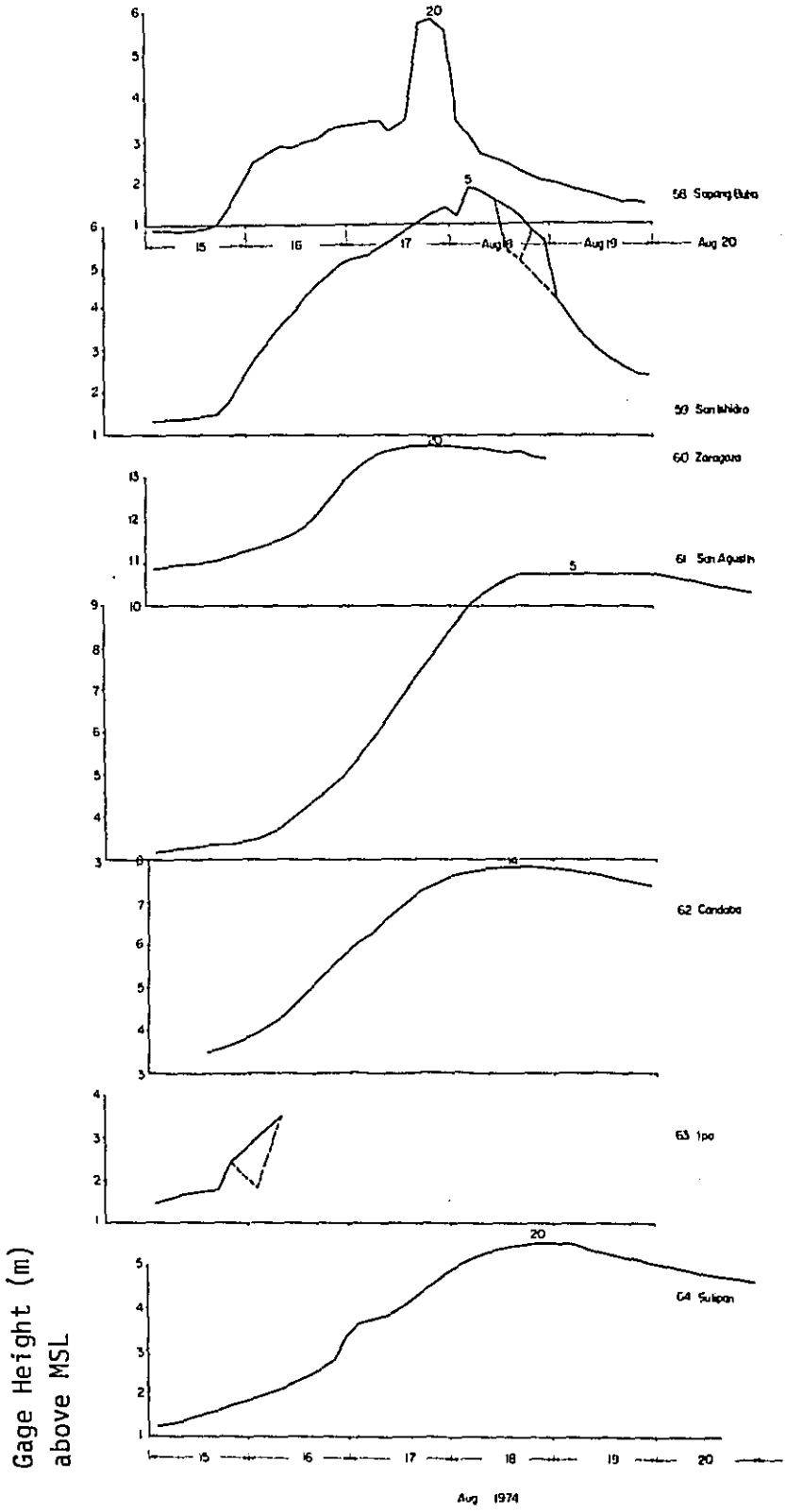


Fig. B.6.17 Hourly Gage Height at Telemetering Stations
Aug. 15-17, 1974

Table B.6.66 Mean Daily Gage Height at Sulipan, Apalit Aug. 1974

Monthly summary of mean daily gage height (m)

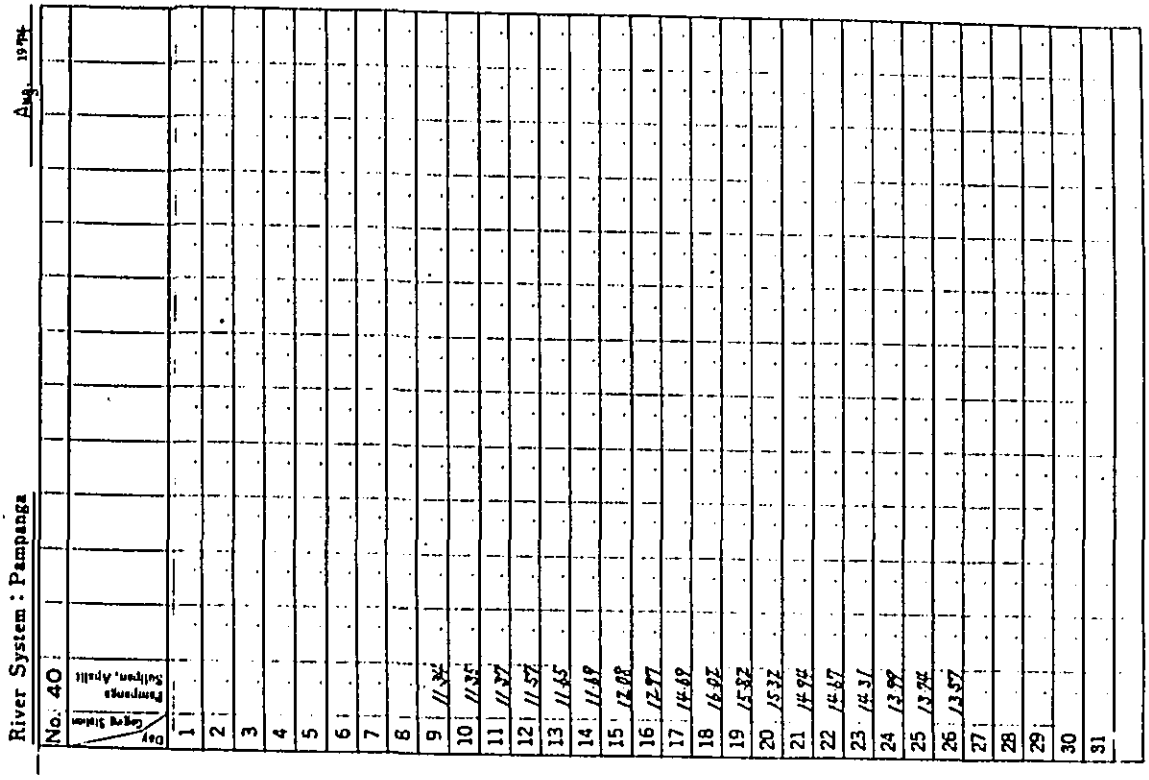


Table B.6.67 Date and Time of Peak Hourly Rainfall, and that of Peak Hourly Gage Height: Time Difference between Two Peaks Flood of June, July and Aug. 1974

Telemetering Station		Flood of June 1974			Flood of July 1974		
		Date and Time		Time Difference	Date and Time		Time Difference
No.	Location	Peak Rainfall	Peak Gage Height	(hr)	Peak Rainfall	Peak Gage Height	(hr)
1)	Sapang Buho		June11, 2:00			July20; 17:00	
2)	Papaya	June10, 22:00			July20, 13:00		
3)	San Isidro	June10, 20:00	June11, 8:00	12	July20, 16:00	July21, 8:00	16
4)	Zaragoza	June10, 18:00	June12, 20:00	50	July20, 16:00		
5)	Arayat	June10, 23:00	June12, 2:00	27	July20, 15:00	July21, 20:00	29
6)	Sibul Spring	June10, 22:00			July20, 15:00		
7)	Candaba	June10, 20:00	June14, 20:00		July20, 15:00	July22, 17:00	
8)	Ipo	June10, 24:00			July20, 14:00		
9)	San Rafael	June10, 21:00			July20, 15:00		
10)	Apalit	June10, 19:00	June12, 5:00	34	July20, 16:00	July 21,14:00	22

Telemetering Station		Flood of August 1974		
		Date and Time		Time Difference
No.	Location	Peak Rainfall	Peak Gage Height	(hr)
1)	Sapang Buho	Aug.15, 15:00	Aug.17, 20:00	29
2)	Papaya	Aug.17, 15:00		
3)	San Isidro	Aug.17, 14:00	Aug.18, 5:00	15
4)	Zaragoza	Aug.17, 14:00	Aug.17, 20:00	5
5)	Arayat	Aug.17, 15:00	Aug.19, 5:00	38
6)	Sibul Spring	Aug.17, 14:00		
7)	Candaba	Aug.17, 14:00	Aug.18, 14:00	24
8)	Ipo	Aug.17, 16:00	Aug.17, 17:00	1
9)	San Rafael	Aug.17, 15:00		
10)	Apalit	Aug.17, 15:00	Aug.18, 20:00	29

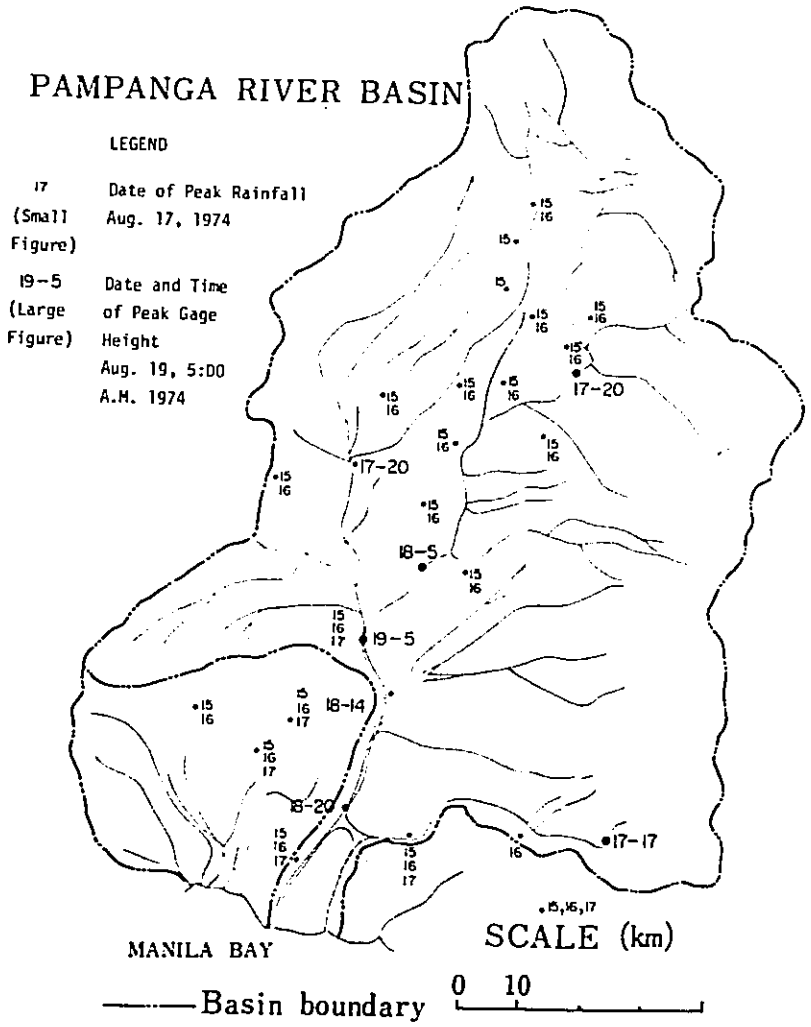


Fig. B.6.19 Date of Peak Daily Rainfall, and Date and Time of Corresponding Peak Hourly Gage Height Aug. 1974

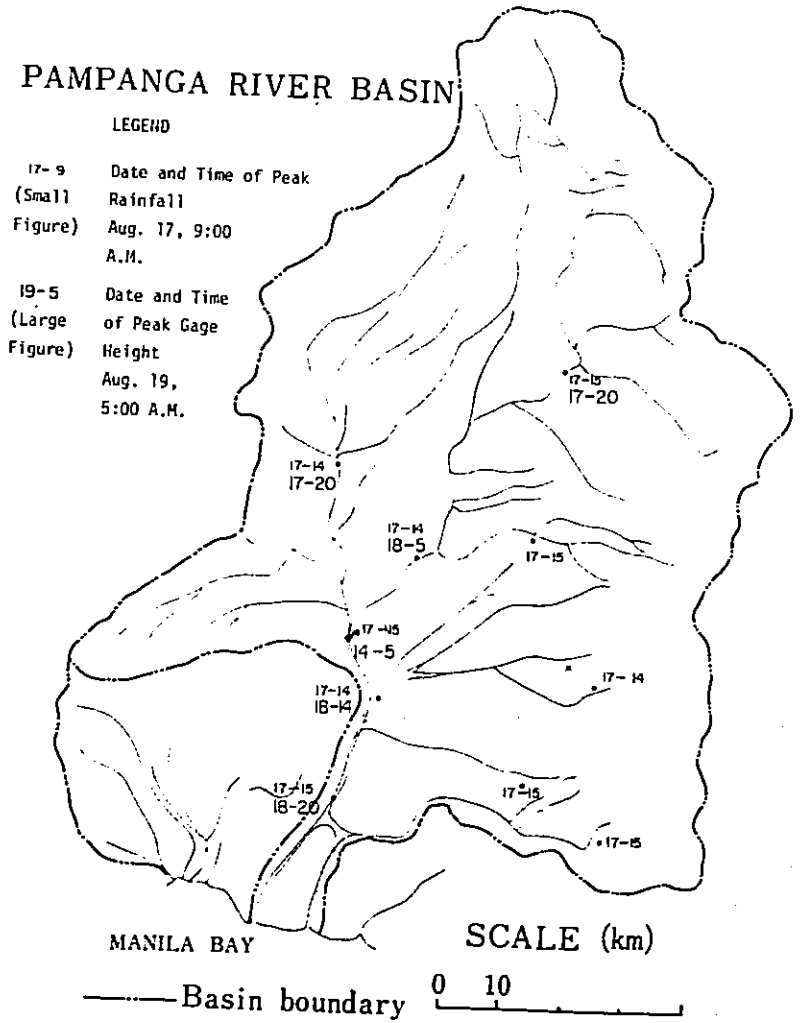


Fig. B.6.18 Date and Time of Peak Hourly Rainfall, and that of Corresponding Peak Hourly Gage Height Aug. 1974

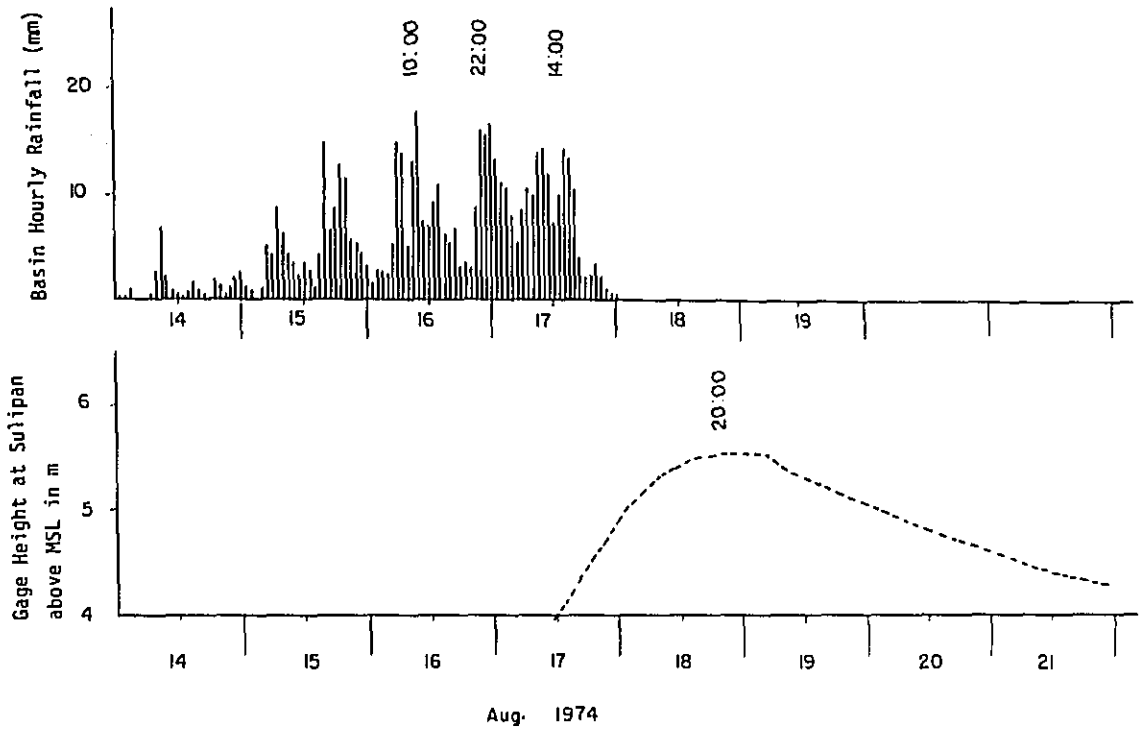


Fig. B.6.20 Hourly Gage Height at Sulipan, Apalit, with Basin Hourly Rainfall Aug. 14-21, 1974

(7) Flood Record

(i) Floods of June and July 1974

A severe tropical storm which crossed Central Luzon in the afternoon and evening of June 10 caused moderate flooding in some areas in the Upper Pampanga basin on June 11-12. The maximum average basin rainfall for the 24-hour period ending at 8 a.m. of June 11 was 148.9 mm. Five flood advisories were issued from June 10-12.

Typhoon Iliang (IVY) followed a west-northwesterly track across Central Luzon in the morning and afternoon of July 20 and gave rise to moderate floods in Nueva Ecija in the Upper Pampanga basin from July 20-23. The 24-hour average basin rainfall recorded at 8 a.m. of June 21 was 97.6 mm. Nine flood advisories were issued by the Flood Forecasting Center during the period July 19-23.

It appears that the storm rainfall associated with the tropical disturbances in June and July were not large enough to satisfy the storage capacity of Candaba Swamp; hence no flooding occurred in the Lower Pampanga area downstream of the swamp.

(ii) Flood of August 1974

Meteorological conditions associated with the destructive August Flood consist of a series of tropical disturbances occurring over the Pacific and South China Sea from the first up to the third week of August. The first was a tropical depression which developed about 880 km. east of the Visayas on August 4. It followed a northwesterly track and weakened into a low pressure area over the Batanes on August 8 when another low pressure area west of Luzon intensified into a tropical storm and moved north-northeast towards Formosa until August 10. Southwest monsoon conditions induced by these two disturbances prevailed over Luzon and western Visayas during the second week of August. The third disturbance was Severe Tropical Storm MARY which followed a west northwesterly track from Chichijima on August 15; over Naze on August 18 and reached the eastern coast of China mainland on August 20. Further intensification of the prevailing southwest monsoon which resulted in moderate to heavy continuous rain over Luzon during the third week of August is attributed to Tropical Storm MARY and the small low pressure areas to the east and west of the Batanes.

Although none of these tropical disturbances crossed Luzon, the prevailing southwest monsoon condition gave flood-producing rainfall over the Pampanga River basin from August 16-18. The average basin rainfall calculated from records of the telemetering station network for the 24-hour period ending at 0800H are as follows:

August 16	128.7 mm.
August 17	183.7 mm.
August 18	86.5 mm.

A maximum 24-hour average basin rainfall of 200 mm. was recorded for the period 16/1700H - 17/1700H.

The total amount of rainfall during the flood from 15-19th as recorded at Port Area, Manila was 507 millimeters while in Apalit, Pampanga it was 513 millimeters and 578 millimeters in Candaba, Pampanga.

The 4-meter critical water level at Sulipan, Apalit was reached at approximately 10:00 a.m. on August 17. The maximum water level at this station reached 5.54 meters (based on water level gage date telemetered to the Flood Forecasting Center). At 8:00 p.m., August 18 and prevailed until 2:00 a.m., August 19, when it began to recede gradually.

(8) Flood Forecasting

(i) Introduction

In 1974 the Flood Forecasting Center issued flood advisories during three periods when Central Luzon was severely affected by the occurrences of tropical disturbances. Except for some minor trouble, the Telemetering System functioned satisfactorily and provided vital data needed in the preparation of flood advisories. Experts of the Typhoon Committee Secretariat (TCS) and the Overseas Technical Cooperation Agency (OTCA) of Japan provided technical advice to the local staff in operational flood forecasting. The Telecommunication Expert of OTCA also supervised the emergency repairs and maintenance of the Telemetering System during the period.

(ii) Operational Flood Forecasting

At 8 a.m. August 15, Tropical Storm Norming (NADINE) was about 360 miles east of Luzon and moving eastward while Severe Tropical Storm MARY was in the vicinity of Chichjima. The Telemetering System has been set to transmit 6-hourly rainfall and water level data to the Flood Forecasting Center and reports showed that moderate monsoon rains have been falling over the Pampanga River basin for the past 24 hours and water levels at all gauging stations are rising gradually. Owing to the distance of the tropical storms from Luzon, no flood advisory was issued on August 15.

At 8 a.m. of August 16, reports from the Telemetering Station Network gave moderate to heavy continuous rain over the basin during the past 24 hours while stage hydrographs at six gauging stations showed increasing rates of rise of water levels during the past 12 hours. Meanwhile, Severe Tropical Storm MARY has moved west northwest at an average speed of 20 kph. toward Naze. At 10 a.m. of August 16, it was therefore decided to issue the initial flood advisory for threatened areas in the Upper and Middle Pampanga basin.

A weather satellite picture received at about 11 a.m. gave positive indications of prolonged heavy rains over Luzon. This information together with the sharp increase in water levels at Zaragoza, San Isidro, Arayat and Candaba prompted the Flood

Forecasting Center to issue two more advisories on August 16. The advisories included the forecast stage at Sulipan and appropriate warnings for the Lower Pampanga basin and threatened areas downstream of Sulipan.

A total of sixteen (16) Flood Advisories were issued by the Flood Forecasting Center from August 16 up to August 22. These were relayed to the National Disaster Control Center for dissemination to the general public; particularly the flood-threatened areas. Flood advisories were also relayed to the BPW Manila, BPW Pampanga River Control System at Sulipan, Apalit and the PAGASA Synoptic Weather Station at Cabanatuan, Nueva Ecija. Representatives of the Media and private individuals were given information concerning the flood upon request.

Regular reports from the Pampanga River Control System at Sulipan, Apalit on actual conditions observed at Apalit and adjacent areas and at their water control structures during the flood helped a great deal in the preparation of flood advisories. Information on the flood received from the Cabanatuan Weather Station were also found useful.

(iii) Discussion

In order to have a better basis for defining the forecast hydrograph at Sulipan, it was decided to conduct calculations of runoff from average basin rainfall twice each day. Runoff calculations using the "Tank Model" for the Pampanga River basin originally proposed by A. Hamamori, TCS Hydrologist, were conducted based on 24-hour average basin rainfall periods ending at 8 a.m. and 8 p.m. Thus, values of forecast stage were plotted every 12 hours. A stage-discharge relationship obtained from discharge measurements conducted by BPW engineers during the October 1973 flood was used to convert the calculated runoff in terms of stage at Sulipan. In the case of the August Flood however, it was found necessary to use a one-day instead of a two-day time lag in order to obtain a better correspondence between the forecast and observed stage hydrographs. This implies a time of concentration of rainfall of about one day for the basin. A detailed study of the rainfall patterns associated with crest stage heights in the August Flood showed some interesting features.

Areal distribution of rainfall over the basin during the prevailing southwest monsoon conditions were found markedly different from those associated with tropical cyclones crossing Central Luzon. Duration of heavy falls are much longer and maximum rainfall areas are found in the southern and western portion of the basin. This could explain the shorter time of concentration observed in the August Flood. Fig. B.6.15 ∿ B.6.17 show the distribution of rainfall during the three-day period of continuous moderate to heavy rains.

The isohyetal maps were based on reports of 10 rainfall-telemetering stations and 21 rainfall-recording stations within and near the basin.

Figure B.6.21 gives a comparison of the observed hydrograph (telemetered data) and the computed or forecast hydrograph with a one-day time lag. The hydrographs show good agreement after August 16. The difference between the observed and computed hydrographs prior to August 16 could possibly be attributed to choked intake pipe of the stilling well at the Sulipan gauging station. A comparison of staff gauge readings and corresponding telemetered data at Sulipan during the flood tends to support this explanation of the discrepancy.

Some significant observations pertaining to the August Flood are summarized as follows:

1) A time lag of about one day seems suitable for floods brought about by prevailing southwest monsoon situations. The areal distribution of rainfall should, however, be continually examined during operational flood forecasting work to find out if rainfall maxima tend to occur in the southern and western portions of the basin.

2) A critical water level of about 4 meters above mean sea level at Sulipan was confirmed by the August Flood.

3) Examination of the flood hydrographs of Sulipan and Candaba seems to indicate that the storage capacity of Candaba Swamp is satisfied when the water level at the Candaba station reaches about 6 meters above mean sea level.

4) The initial flood advisory should have been issued earlier. However, it was not anticipated that a distant tropical cyclone in the vicinity of Chichijima, together with small low pressure areas to the east and west of the Batanes could trigger the strong surge of the southwest monsoon; which brought flood-producing rains over Central Luzon from the evening of August 15 up to the evening of August 17.

On the whole, the results of the flood forecasting work can possibly be considered as fair. The approximate time when the water level at Sulipan was expected to reach the 4-meter critical level was forecast with a time advantage of more than 15 hours. The time and magnitude of the crest stage height at Sulipan from 8 p.m. of August 18 to 2 a.m. of August 19 was also forecast within acceptable limits.

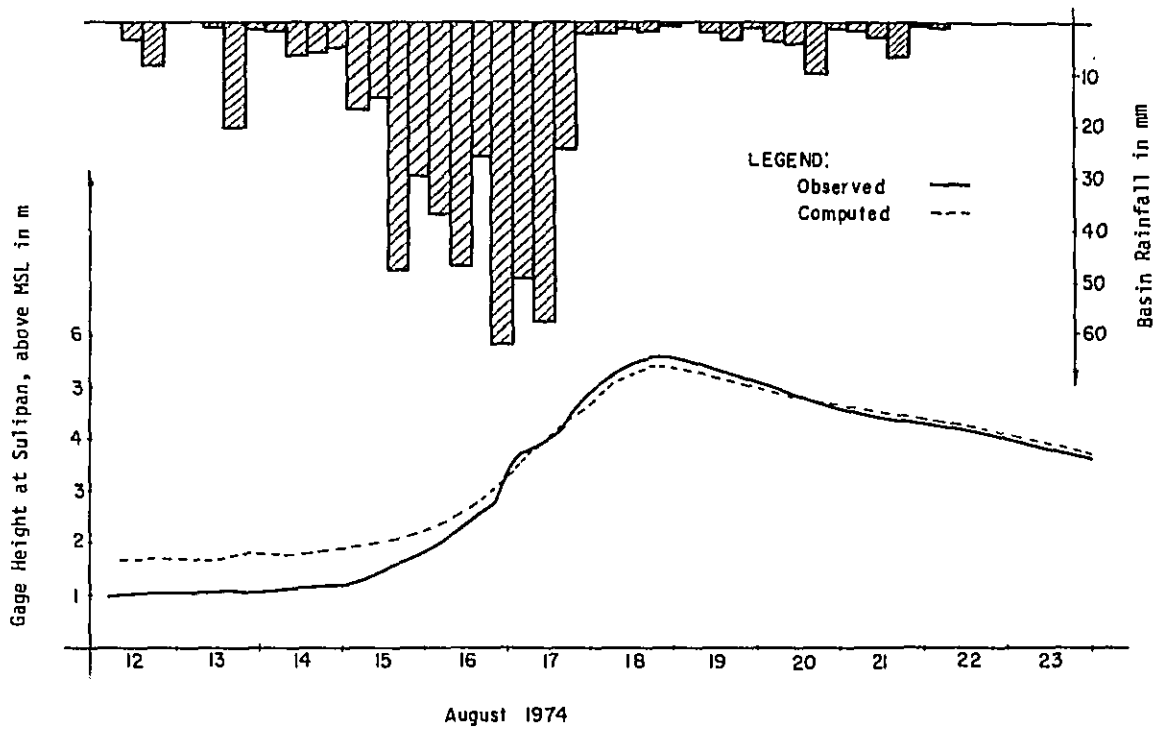


Fig. B.6.21 Computed and Observed Hydrographs at Sulipan, Apalit, with 6-Hourly Average Basin Rainfall Aug. 12-23, 1974

(iv) Sample Flood Advisories

Sample (1)

FLOOD FORECASTING CENTER
PAGASA, QUEZON CITY

16 AUGUST 1974

FLOOD ADVISORY NO. 3
ISSUED AT 16/2200 H

AT 9 PM AUGUST 16 THE WATER LEVELS OF RIVERS IN THE PAMPANGA RIVER BASIN AND CANDABA SWAMP ARE STILL RISING STEADILY. FLOOD CONDITIONS WILL PREVAIL OVER SOME AREAS IN NUEVA ECIJA, PAMPANGA AND BULACAN TONIGHT AND TOMORROW.

THE WATER LEVEL AT SULIPAN CONTINUES TO RISE AND IS FORECAST TO REACH THE 4 METER CRITICAL LEVEL TOMORROW MORNING. FLOODING CONDITIONS ARE EXPECTED OVER THE LOWER PAMPANGA TOMORROW AUGUST 17. THREATENED AREAS INCLUDE APALIT, CALUMPIT, HAGONOY, PAOMBONG AND MALOLOS.

AFFECTED AREAS IN NUEVA ECIJA, PAMPANGA AND BULACAN:

CABANATUAN, SANTA ROSA, GAPAN, ZARAGOZA, LA PAZ, TALAVERA, ALIAGA, LICAB, JAEN, SAN ISIDRO, SAN ANTONIO, CABIAO, ARAYAT, CANDABA, SAN LUIS, SAN SIMON, SAN MIGUEL AND SAN ILDEFONSO.

Sample (2)

FLOOD FORECASTING CENTER
PAGASA, QUEZON CITY

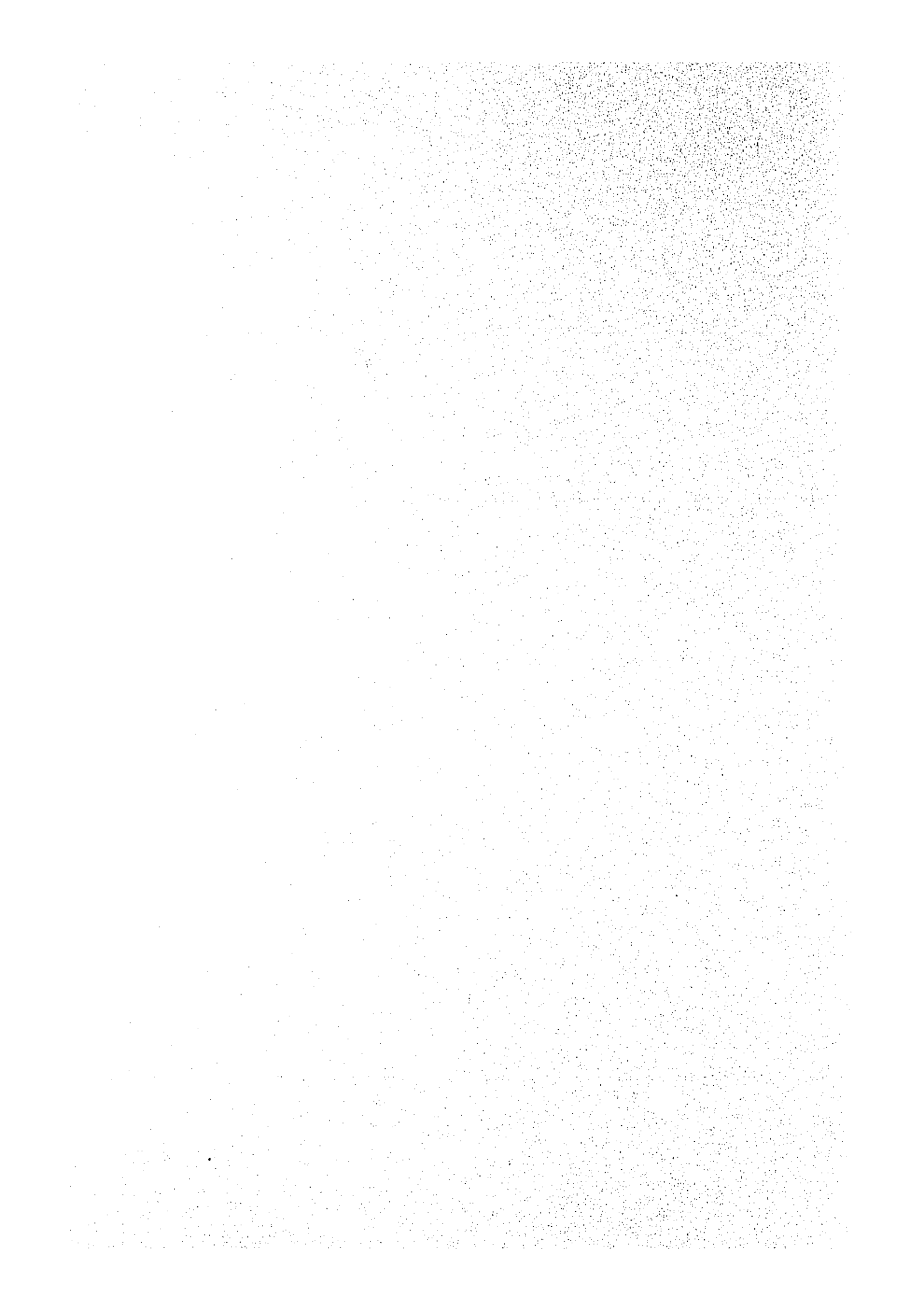
17 AUGUST 1974

FLOOD ADVISORY NO. 4
ISSUED AT 17/1030H

AT 9 A.M. AUGUST 17 THE WATER LEVELS OF RIVERS IN THE PAMPANGA RIVER BASIN AND CANDABA SWAMP ARE STILL RISING STEADILY. WORSEMING FLOOD CONDITIONS ARE EXPECTED TO PREVAIL OVER SOME AREAS IN NUEVA ECIJA, PAMPANGA AND BULACAN TODAY AND TOMORROW AUGUST 18. AFFECTED AREAS INCLUDE CABANATUAN, STA. ROSA, GAPAN, ZARAGOZA, LA PAZ, TALAVERA, ALIAGA, LICAB, JAEN, SAN ISIDRO, SAN ANTONIO, CABIAO, ARAYAT, CANDABA, SAN LUIS, SAN SIMON, SAN MIGUEL AND SAN ILDEFONSO.

THE WATER LEVEL AT SULIPAN HAS REACHED THE FOUR (4) METER CRITICAL LEVEL AT ABOUT 10 O'CLOCK THIS MORNING. IT IS STILL EXPECTED TO RISE STEADILY AT LEAST DURING THE NEXT 24 HOURS. FLOOD CONDITIONS WILL PREVAIL OVER THE LOWER PAMPANGA TODAY AND TOMORROW.

SOME OF THE AREAS AFFECTED ARE APALIT, CALUMPIT, PULILAN, HAGONOY, PAOMBONG AND MALOLOS.



C : Appendix

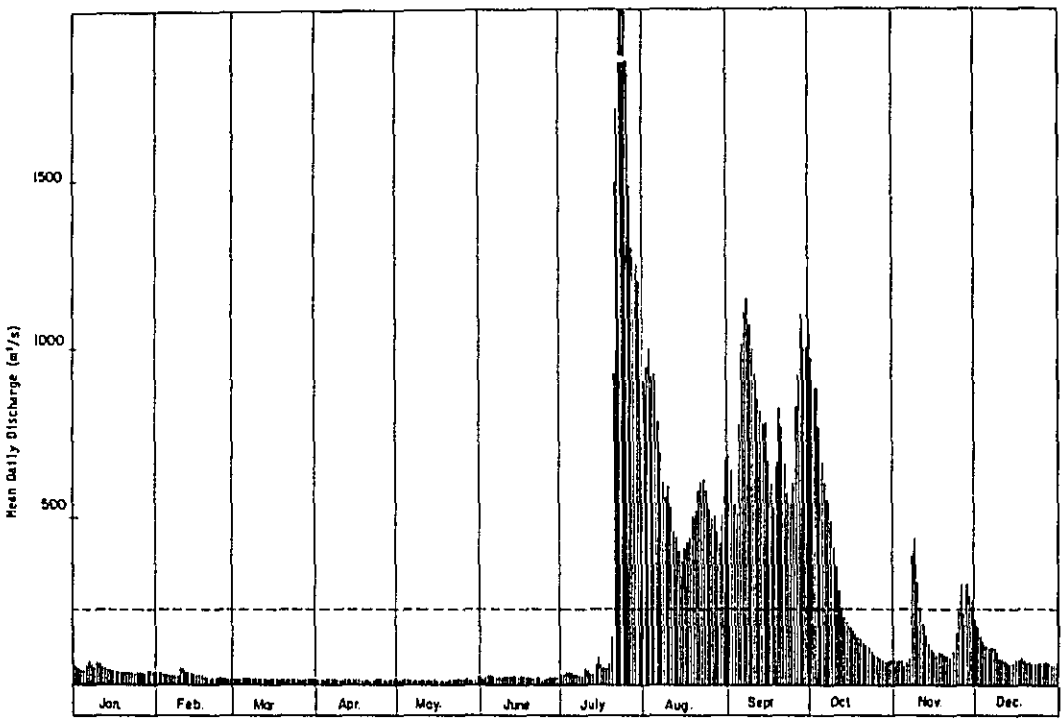


Fig. C.1.1 Mean Daily Discharge at San Agustin, Apalit, for 1960

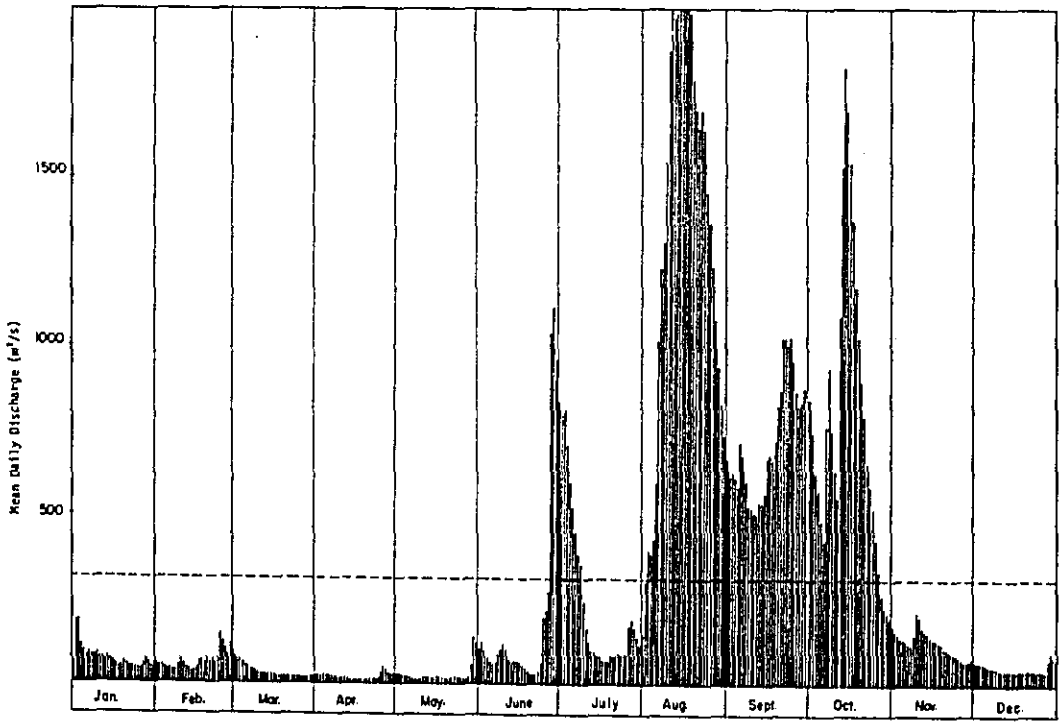


Fig. C.1.2 Mean Daily Discharge at San Agustin, Apalit, for 1962

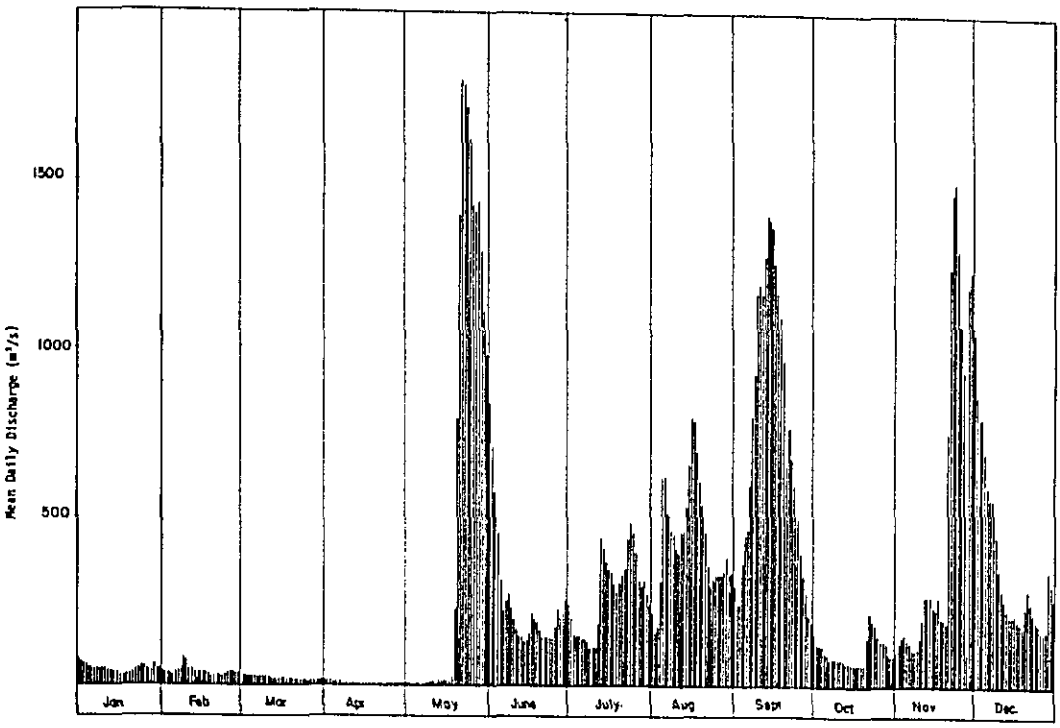


Fig. C.1.3 Mean Daily Discharge at San Agustin, Apalit, for 1966

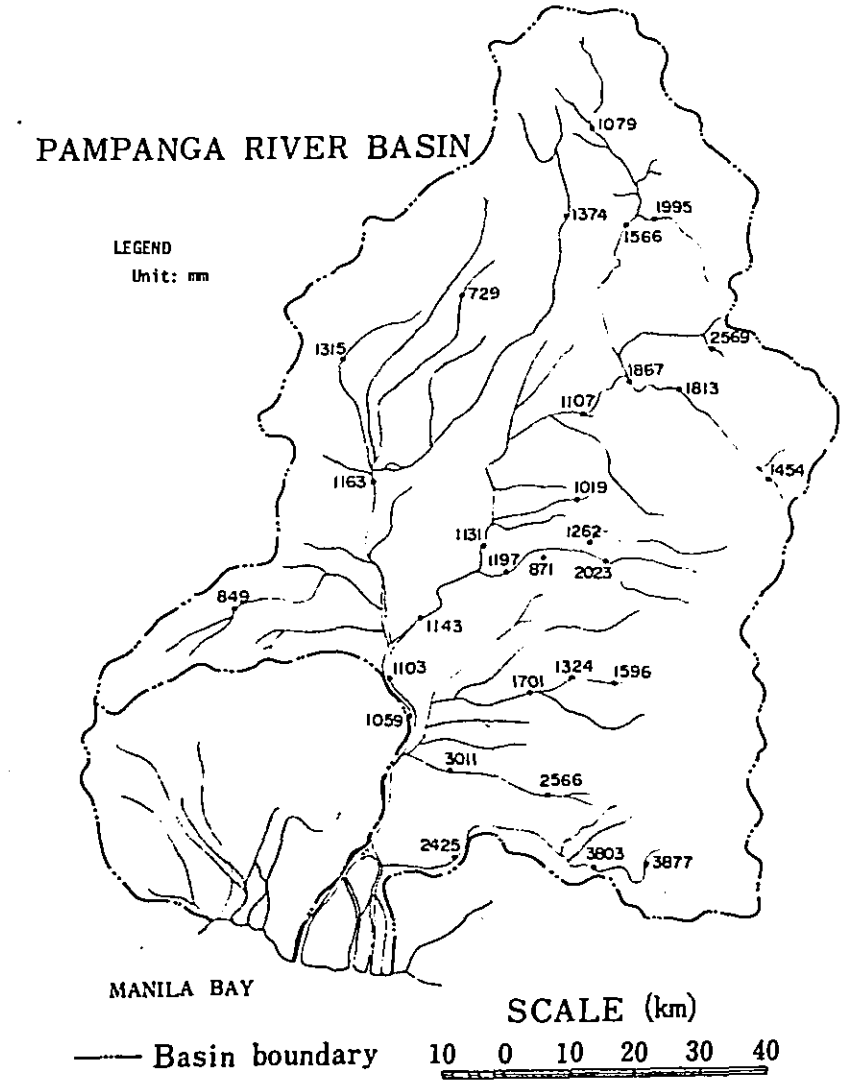


Fig. C.2.2 Annual Volume of Runoff for 1962

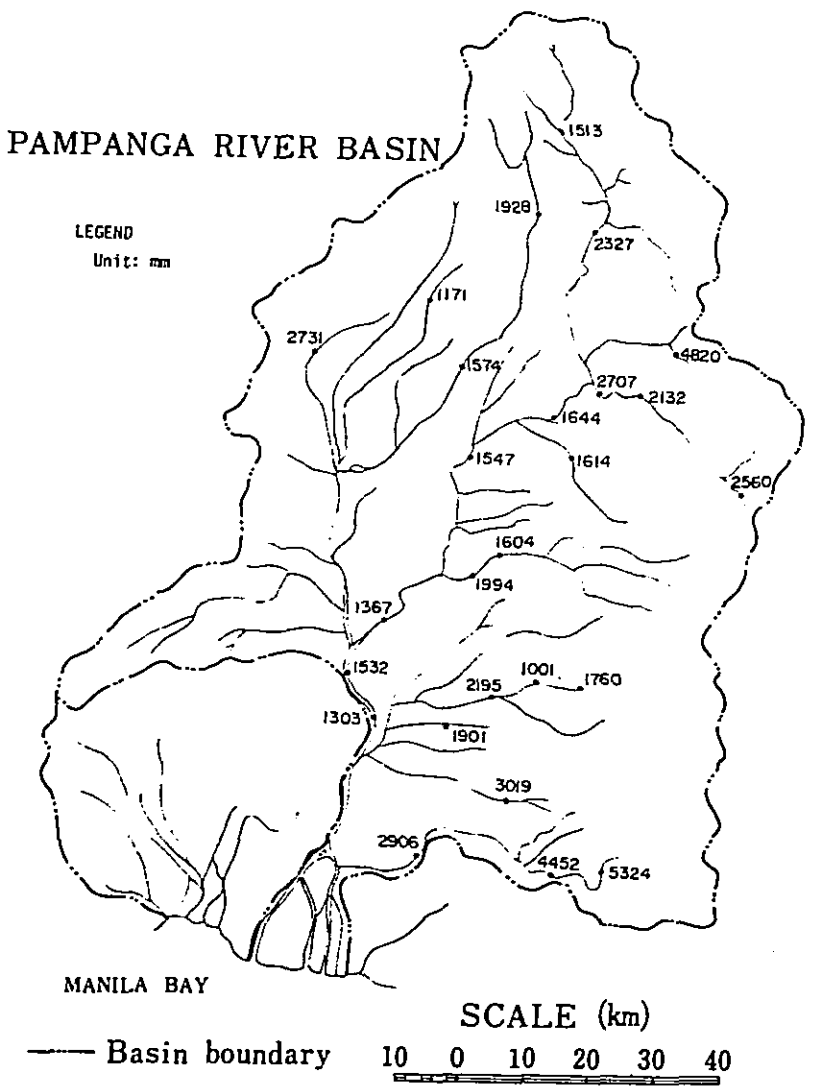


Fig. C.2.1 Annual Volume of Runoff for 1960

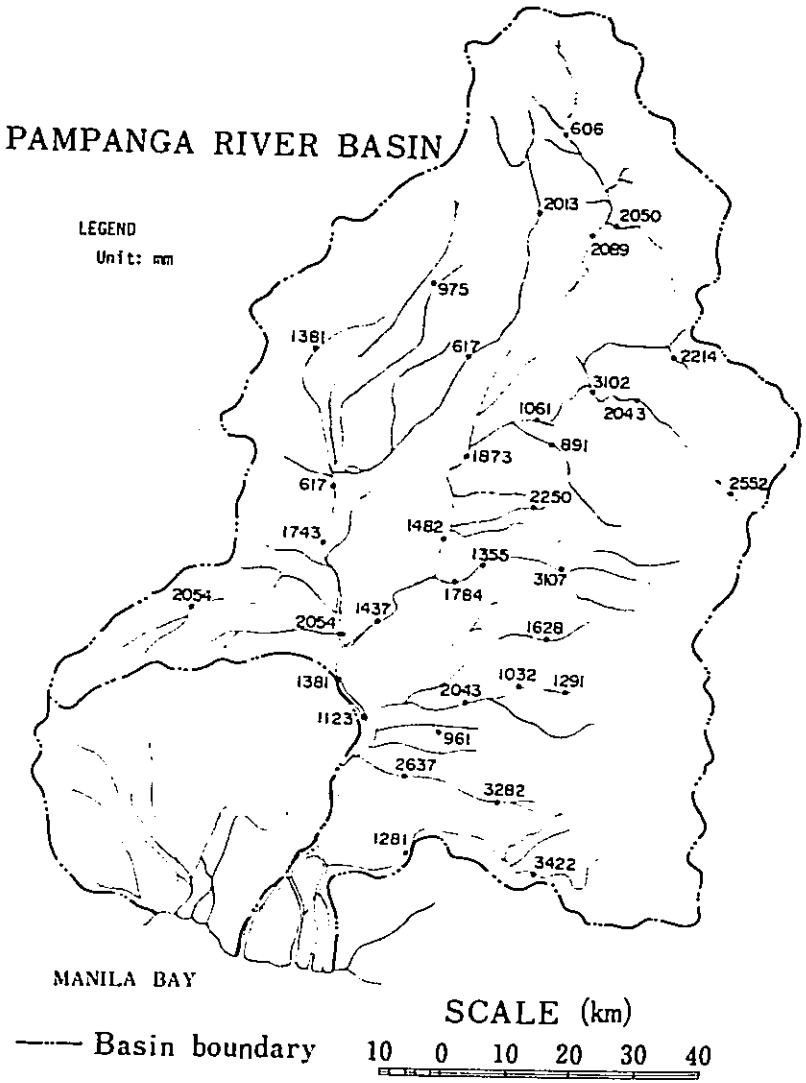


Fig. C.2.3 Annual Volume of Runoff for 1966

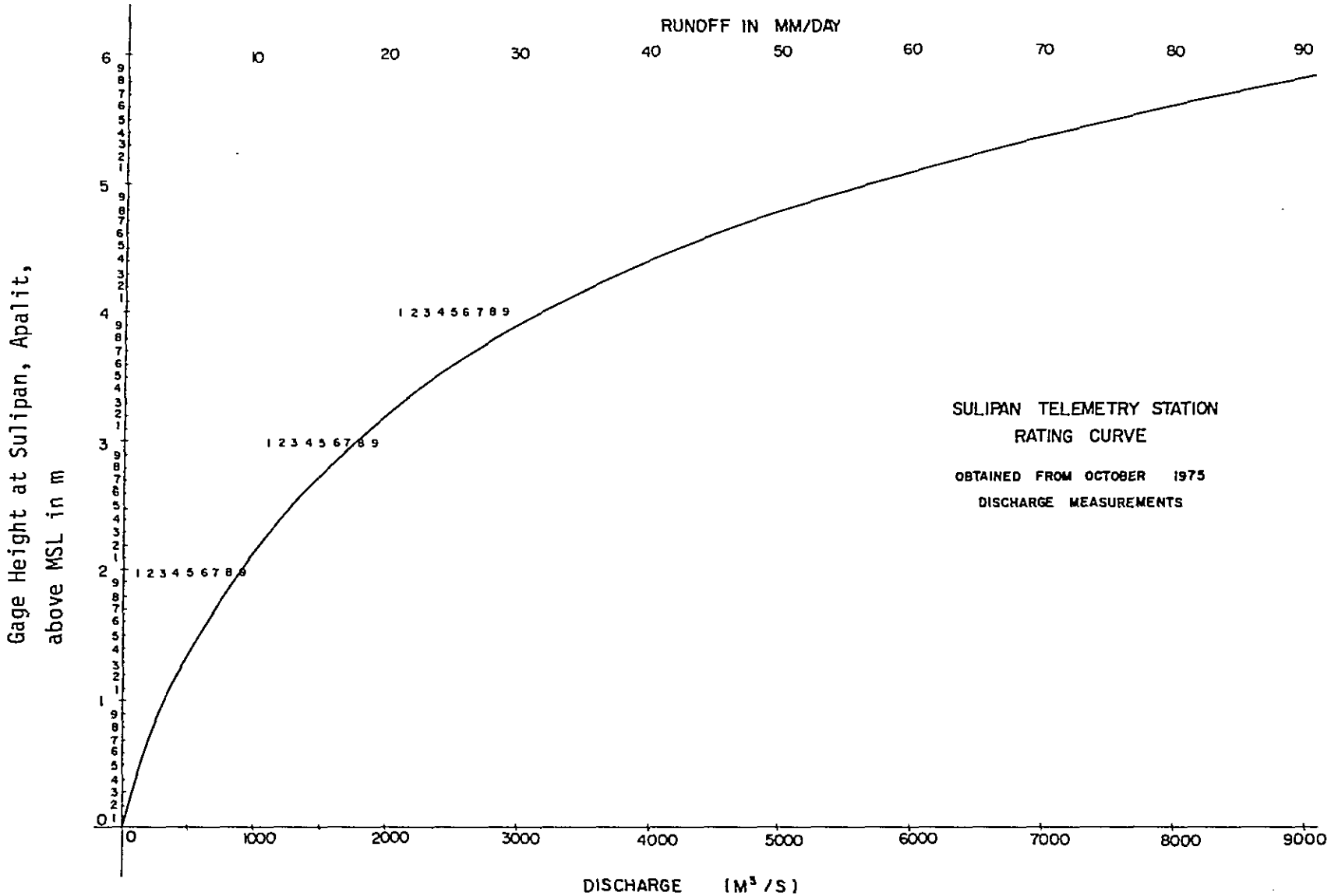


Fig. C.3 Relation between Stage and Discharge at Sulipan, Apalit, during the Flood Time

Table C.1 Soil Moisture Deficit in Manila

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
(1) Mean Monthly Rainfall (mm)	22.8	11.0	17.3	32.6	128	255	416	435	349	194	141	69	2,070.7
(2) Mean Monthly Temperature (C)	25.0	25.5	27.7	28.3	28.6	27.9	27.1	27.0	26.9	26.7	25.9	25.2	26.8
(3) Potential Evapotranspiration (mm)	103.8	106.5	149.8	156.2	169.3	158.8	157.1	150.7	141.4	138.2	116.9	107.7	1,656.4
(4) Soil Moisutre Deficit (mm)	81	95.5	132.5	123.6	41.3	-	-	-	-	-	-	38.7	512.6

Remarks: C.(8) References

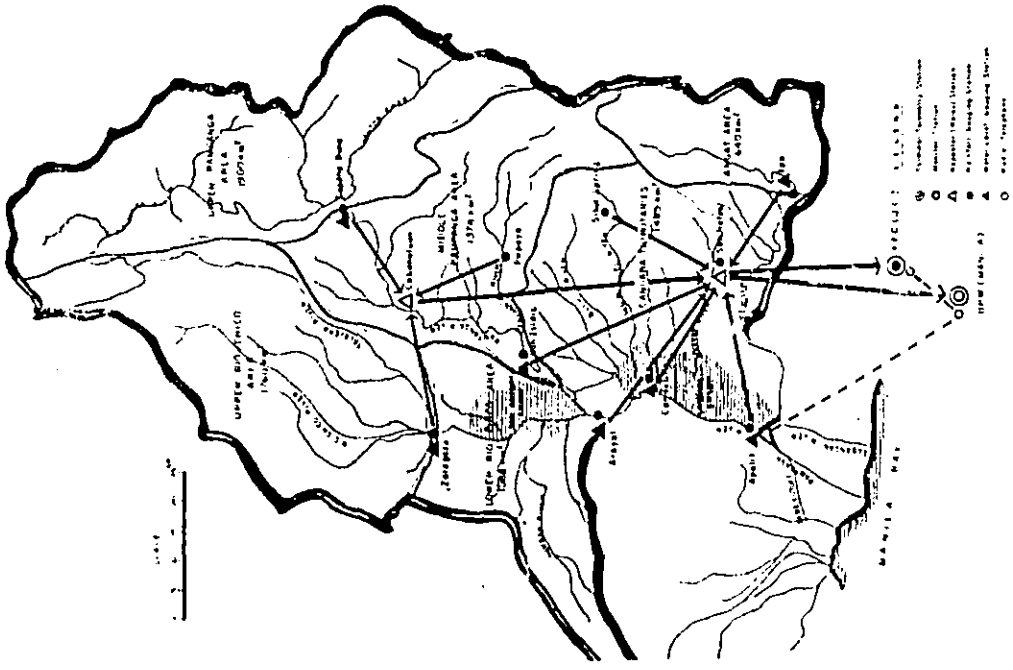


Fig. C.4 Telemetering System Network for the Flood Forecating and Warning System on the Pampanga River Basin

Table C.2 Average Annual Flood Losses in Major Philippine Rivers

	RIVER BASIN	Commercial and Residential Bldg., etc.	Agricultural Crops	Livestock and Fishing Industry	Roads, Bridges and Other Government Property	Indirect Losses	Total Average Annual Flood Losses	Total Area Flooded in Hectares
	LUZON							
1.	Pasig-Marikina River	10,500,000	-	-	1,670,000	713,400	12,883,400	10,890
2.	Pampanga River System							
	(a) Pampanga River	170,000	5,421,800	181,500	151,000	88,700	6,013,000	143,680
	(b) Rio Chico River	111,000	1,420,800	118,500	99,000	56,700	1,806,000	57,440
	(c) Angat River	27,000	514,230	30,000	25,000	19,770	616,000	18,922
3.	Gumain-Porac-Caulaman	18,400	298,400	25,300	13,450	9,650	365,200	12,300
4.	Pasig-Potrero River	23,100	268,250	23,800	19,650	11,400	346,200	9,800
5.	Agno River System							
	(a) Agno River	73,400	1,714,800	148,200	63,900	63,500	2,063,800	
	(b) Tarlac River	6,250	269,350	12,650	5,430	5,420	299,100	172,000
	(c) Viray-Dipalo River	2,350	104,550	4,150	1,670	5,780	118,500	
6.	Bicol River	142,100	710,050	118,000	81,800	78,550	1,130,500	46,700
7.	Albay River	137,200	273,640	34,800	46,500	35,560	527,500	11,460
8.	Laoag River	20,000	39,460	31,400	60,000	14,440	165,300	24,430
9.	Cagayan River	138,100	928,215	278,450	119,300	118,135	1,582,200	56,760
	VISAYAS							
10.	Ilog-Hilabangan River	84,800	552,000	51,100	37,700	30,200	755,000	10,000
11.	Jalaur River	7,260	221,900	22,800	10,200	6,740	268,900	15,600
12.	Panay River	82,500	540,100	50,000	36,900	29,500	739,000	54,340
	MINDANAO							
13.	Agusan River	495,500	1,026,500	170,670	204,500	250,000	2,147,170	187,400
14.	Cotabato River	271,500	1,974,830	87,200	111,500	141,870	2,586,900	172,650
	TOTAL	12,310,460	16,278,875	1,385,520	2,757,500	1,697,315	34,413,870	1,004,442
	PERCENTAGE OF DAMAGE	36%	47%	4%	8%	5%		

Remarks: (1) Presented to the Meeting of Working Group of Experts on Typhoons, ECAFE/WMO, Manila, December 1965

(2) Unit : Pesos 1. Dollar (U.S.) = 3.90 Pesos (Philippine)

(7) Abbreviation

1) BPW : Bureau of Public Works
Water Resources Survey Division
Surface Water Branch

2) SWSB : Surface Water Supply Bulletin
Surface Water Supply of the Philippines

3) WB : Weather Bureau
Weather Bureau changed its name to PAGASA in 1972.

4) PAGASA (PA) : Philippine Atmospheric, Geophysical and Astronomical Service Administration
Department of National Defense
Republic of the Philippines

5) FFC : Flood Forecasting Center
Established in October 1973.

6) JR : The Overseas Technical Cooperation Agency, Japanese Government: Report on the Feasible Survey for the Establishment of Comprehensive Plan of the Flood Forecasting and Warning System in the Pampanga River Basin, March 1970

7) TT : Tables and Figures prepared by Mr. Takenouchi

8) TCS : Typhoon Committee Secretariat

(8) References

1) BPW : Evaporation and other climatic Observation
Vol. I 1956-1960
Vol. II 1961-1965

2) BPW : Surface Water Supply of the Philippines

(i)	Surface Water Supply Bulletin	No. 4	1960-1961
(ii)	"	No. 5	1962
(iii)	"	No. 6	1963
(iv)	"	No. 7	1964
(v)	"	No. 8	1965
(vi)	"	No. 9	1966

3) BPW : The Pampanga River Flood of Aug. 1960

4) BPW : The Pampanga River Flood of July 1962

5) Typhoon Committee Secretariat : Runoff Analysis and Flood Forecasting Study of the 1972 Flood in the Pampanga River Basin, October 1972

6) The Overseas Technical Cooperation Agency, Japanese Government: Report on the Feasible Survey for the Establishment of Comprehensive Plan of the Flood Forecasting and Warning System in the Pampanga River Basin, March 1970

7) ECAFE Water Resources Series No. 28 Proceedings of the Sixth Regional Conference on Water Resources Development in Asia and Far East "Water Balance with Particular Reference to Soil Moisture Deficiency in Potentiality Irrigable Areas" P66-83 1965

(9) List of Tables and Figures

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